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GAS JOURNAL

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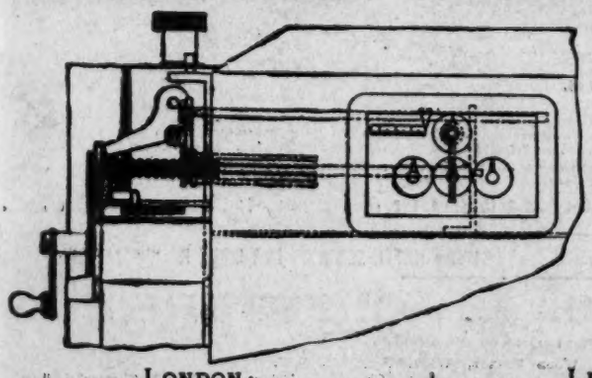
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VOL. CXXXIX., No. 2826.] TUESDAY, JULY 10, 1917. [69TH YEAR.

EDITORIAL NOTES.

The Coal Controller's Redistribution Scheme. Position of Contracts.

THE matter of greatest importance to the gas industry, and to all other large coal consumers, in our columns this week is the information as to the coal redistribution scheme, to which effect is given by an Order of the Board of Trade, and which has been developed by the Coal Controller (Mr. Guy Calthrop) and his staff, after the collection of a large mass of statistics and their study, a free interchange of views with the District Coal and Coke Supplies Committees, representative coal factors, merchants, and consumers, and the Railway Executive Committee. From the particulars, it is clear that nothing has been left undone that could be done to ensure a scheme of a practical nature. Naturally, large coal users will not care to be disturbed from their normal lines of supply or from the contracts that, in their wisdom and experience-created preference, they have already made for the present contract year. But the situation of transport, current and prospective, has to be faced; and there is an obligation upon everyone who is not fortunate enough to be within a defined area from which the coal for which he has contracted is derived, or who obtains his coal by sea, to do his part to work to establish quickly the scheme and to aid in relieving the critical position of rail transport that menaces next winter. The penalty of neglect will be his own burden. For the gas industry, it is a great pity—but, of course, a scheme of this magnitude cannot be investigated and framed in a few days—that the redistribution plan was not available before the work of negotiating and settling new contracts was entered upon this year. But it could not be. So the best has to be made of it; and, what is more, the best use should be made of the period between now and Sept. 10 (when the scheme comes into operation) to get all possible coal into stock under the present contracts, which—with the exception of those for coal produced and consumed within the same area, and those for seaborne coal—will be automatically annulled at 6 p.m. on Saturday, Sept. 8. We may take it, however (the point is one which ought to be made abundantly clear by the Controller), that those who have long-distance contracts between areas recognized by the scheme will not come under this wholesale cancellation. Otherwise there may be some inconvenient attempts to shuffle out of contracts, some of which have been entered into by the buyers with the view to complying with the earlier order as to purchasing from the nearest available areas. However, the abrogation of contracts means that, in addition to utilizing the interval in obtaining all possible coal under present contracts, those affected will have to arrange their new contracts well before Sept. 8—for safety and freedom from anxiety, the earlier the better. The scheme, by the way, does not affect coke.

Let this be borne in mind, that the object of the scheme is to satisfy the coal requirements of the country at large, and that "satisfaction" now resolves itself solely into traffic economy. It is believed that the scheme will result in relieving congestion on the railways, that it will assist the coal trade generally in getting a better "turnover" for their wagons, that it will minimize stoppages at collieries due to delays in the working back of empty wagons over long distances, and from awkward points involving cross country journeys, and that it will economize in marshalling wagons and shunting. It is useless to attempt, before trial, to criticize a scheme so novel, though the collieries and the consumers concerned will, no doubt, from their individual standpoints, see matters for criticism. But this is a question of national importance, and must be viewed from the broadest standpoint. When it is learned that the haulage under the scheme of only 42 million tons of coal per annum out of the total consumed in this country will, according to an approximate estimate, mean a saving of no less than 700 million ton-miles in the transport of coal by rail, it will be realized that, given success, a great work will have been accomplished.

The descriptive article in later columns explains the principles on which the scheme (which deals with long-distance haulage, but short-distance haulage will probably come under treatment later) has been constructed; and it shows that every useful detail that the Coal Controller, in consultation, has been able to introduce into the new distribution system has been brought to bear in order that changes of coal sources and destinations shall be made with as little friction and difficulty as possible. Great Britain has been divided into twenty coal-consuming areas, as shown by a sketch map which we also publish, and the boundaries of these areas will be seen by the appended lists of the towns adjacent to their limits. Lines on the map (drawn from the producing to the consuming areas) indicate the areas from which consuming areas not possessing a coal supply of their own or an inadequate supply may obtain coal by rail. This map is one of perfect simplicity in the matter of directness of supplies in comparison with one which we have that shows a perfect cobweb of crossings and re-crossings of coal in its rail conveyance in December, 1916. Though the re-arrangement will mean inferior coal for some gas undertakings and superior coal for others compared with their customary purchases, if the cob-webbed map can in practice be transformed into the clean straight lined map that we publish, there should be a good chance of those computed hundreds of millions of ton-miles being saved which will be to the country's benefit.

Those holding contracts for coal travelling long distances from one area to another—assuming that the contracts do not comply with the scheme—will, in setting about the making of their new contracts, place themselves in communication with the Coal and Coke Supplies Committee with whom they will have to deal, a list of which Committees we also publish. These Committees (which have been reinforced by an independent representative appointed by the Coal Controller) will conduct the necessary arrangements for putting the new scheme into operation; and, acting as intermediaries, they will save collieries and would-be customers the task of searching for each other. There is a safeguard to which special attention should be directed. It is that, should any factor, merchant, or direct consumer not hear from a colliery by Aug 27 that it has been authorized to send supplies, a communication should be at once made to the District Supplies Committee concerned stating full particulars, in order that inquiries may be made and arrangements effected to ensure a supply before the scheme comes into operation. There may be some little difficulty here. It is, of course, not known how far the statistics obtained by the Coal Controller assure him that production and demand by paired-off areas will have equilibrium. This, however, is one of the factors to smooth working; but it is a difficulty which, if it occurs at all, will (unless for certain areas sea transport breaks down further, which is, of course, a contingency that must be reckoned with) be one for the Supplies Committees to deal with. It is obvious that without the Supplies Committees to act as intermediaries, the scheme would fall before the chaos that would be created. In regard to the supply of special grades of coal where these are necessary for special purposes,

certificates will be issued; but this is a matter that will not affect gas undertakings.

A point which was raised in an editorial on this subject last week was as to the effect of the geographical redistribution on the operation of the Price of Coal (Limitation) Act. We are glad to be able to state that the Coal Controller intends to enforce obedience to the law, and that, in the making of new contracts (with collieries with which customers had not made contracts before) the "corresponding price" will be that paid at that mine, in the words of the Act, on the corresponding date—or as "near thereto as having re-" gard to the course of business may be practicable—in the "twelve months ended the 30th day of June, 1914." In the article in other columns, it is remarked that the Coal Controller intends to deal with those guilty of an infraction of the Act "in no uncertain manner." There is more in these words than meets the eye. That he regards the observance of the Act as most important is seen from the fact that all questions touching attempts to evade it are going to be dealt with by his department direct, and not by the local Coal and Coke Supplies Committees. It is worth knowing that there exists good evidence that there is going to be firm control in this particular direction.

While the Coal Controller has encountered difficulties and objections in constructing his scheme, in the main he has met with the greatest encouragement. By all concerned, it must not be forgotten that he is working for the nation, and not for himself.

Economy and Health through Gas Cooking.

IT is not remarkable that the position and the possibilities of the gas industry should, through the war, have impressed themselves with good effect upon our Government Departments. The members of the Government now know full well that this country entered the war with a very small store of high explosives, that the then production of explosive-making materials by the coke-oven industry and the distillers of gas-works tar was totally inadequate to the requirement, and that it was only by a response by the gas industry to the request to specially work to make up the heavy shortage and to furnish a margin (which it has done) that the country and its Allies were saved from an irreparable disaster, also that munitions production was accelerated by its gas-furnaces, that hundreds of thousands of our munition workers were provided with food cooked by its gas ranges and boilers, and that many industries after the war will be depending upon it not only for light, heat, and power, but largely for the secondary products essential to their work and progress. Knowing these things, no responsible man can do aught else than come to the conclusion that at all costs, for the security of the country and its manufacturers, the gas industry must not only be protected, but must be encouraged to expand its services. There are other things, too, which have struck responsible men, as to the service the gas industry renders to the community. They see in the work it is doing collective and individual economy, and the promotion of health.

On more than one occasion lately, there has been from high quarters advocacy, in connection with fuel economy and the provision of explosives, of the use of gas and coke as fuel, in order to allow a large proportion of the coal now burned to ash in household grates to be employed to greater advantage. Only last week there was renewed advocacy, but for another reason. We have been hearing and reading a great deal about the importance to the nation of baby and its welfare; and a campaign has started which is intended to improve the physical conditions of the new and the coming generations. Hitherto a great deal has been done in the schools and subsequently for bettering the physical conditions of boys and girls; but the start of the work has not been early enough. We have to get back to the embryonic stage to do the maximum amount of good—first, by improving home conditions and by providing the means for securing well-cooked and nourishing food for expectant mothers, and then to see that children from the hour of their birth are well-cared for. The ways in which so desirable a state of things is to be accomplished are several.

The President of the Board of Education (Mr. H. A. Fisher) spoke of some of them at a successful demonstration associated with "Baby Week" at the Guildhall in the City on Monday, the 2nd inst. He mentioned, among other sound ideas, better housing, in association with which he suggested that two "cardinal principles" should be observed —namely, that hot water should be laid on to all dwellings, and that a gas-cooking stove should be put into them. In these ways, mothers would be relieved of hours of useless drudgery, and able to pay more attention to their children. The gas industry takes some credit to itself for having anticipated this, though heretofore it has not had much assistance from the governing authorities, notwithstanding that in all directions the gas cooker and the gas-fire have demonstrated their economy and health promoting merits. Already the gas industry has some four million and many odd thousands of cookers in use in the United Kingdom; and this enormous number does not include privately owned ones, gas-fires, and other gas-heating appliances. What this number of cookers has meant in labour-saving, in the promotion of cleanliness, in the provision of well-cooked food, and therefore in the promotion of health, is incalculable, and what it would be if gas or coke heating became universal is beyond imagination. Besides the actual accomplishment, the gas industry has been doing a large amount of work in connection with the Food Economy Campaign and the Communal Kitchens, in which directions the British Commercial Gas Association has been very active, while upon local Food Economy Committees gas officials have been serving, and putting their knowledge and experience to good use.

But it is all very well to talk of the extension of these health-exalting conditions. Action is required. The Local Government Board are looking into the matter of better housing, and other improvements after the war. The President of the Department (Mr. Hayes Fisher) states that an inquiry is being made of local authorities as to what they are prepared to do in these directions. We cannot say that, though there is much economy inherent in the use of gas for cooking and heating purposes, the local authorities have done much, though to the interest of the community, to foster it. As the other Mr. Fisher truly remarked, the employment of gas-cookers (and we may add of gas-fires and water-heating appliances) relieves a household of a vast amount of useless drudgery. This is putting the matter in a very general way. It goes further than that, as experienced readers know. But we will make brief allusion to the benefits for the information of those who are interested and are influential, but have not intimate contact with the industry. The saving of labour in the household is obvious; and labour-saving is a factor in labour efficiency. We shall in the future want all the output that labour in any usefully productive quarter can effect through saving and higher efficiency. Labour being needed in the working man's home (where coal is the fuel) for fire lighting and attendance and getting the oven to proper temperature, this is often a deterrent to the cooking of food, which frequently means the purchase of cheap, indigestible cooked food of inferior order. Convenience for ready cooking promotes a preference for freshly prepared food at home, and thus contributes to health. A further subscription to labour-saving is that, to the extent that gas is employed for any form of heating, coal has not to be purchased, carted, and handled in small quantities, storage is saved, and the atmosphere is proportionately less polluted by smoke, and again health and cleanliness are promoted—cleanliness in homes and brighter cities and towns generally. This last point is one for all local authorities to consider; but they do not do so in any great measure. In this regard, as things have been, so many of them are content to let them be. Another point which does not appear to strike them is the fact that the more fuel is conveyed by pipes underground, the more will the surface of the roadways be relieved of the frequent cartage of coal by heavy coal-wagons, with their continual effect on wear and tear.

We have spoken of collective and individual economy, and of a general health promotion, by the conversion from bituminous coal burning to the gaseous method in the household. Even so, it is found that gas-cookers and gas-fires have not been encouraged by local authorities, who do not own gas-works; and certainly some of those who do own gas-works have not, strange to say, done all that they might have done in this direction. For instance, from "Field's "Analysis" of the accounts of the principal gas undertakings, it is seen that the percentage of gas-stoves on hire in relation to the number of consumers is, in the case of the Gas Light and Coke Company 85, South Metropolitan Gas Company 99, Commercial Gas Company 75. Of the Suburban Companies, Croydon boasts of 107 p.ct., the South Suburban of 106 p.ct., Brentford of 100 p.ct., Wandsworth of 96 p.ct., the others range between 72 and 79 p.ct. Of the

Provincial Gas Companies, Brighton can claim 106 p.ct., Bristol 84 p.ct., the others range between 60 and 77 p.ct. But when the data for the Provincial Corporations are examined, it is seen that, excluding the very exceptional cases—Birmingham with 83 p.ct. to its credit, Leicester with 98 p.ct., and Manchester with 76 p.ct.—the remainder run from only 2 to 50 p.ct. Of course, it may be that some of these prefer to sell stoves rather than let on hire; but that is a short-sighted policy in view of the undeniable collective and individual advantages derivable by promoting, by every reasonable expedient, the change from coal to gas. It is hoped that, in connection with housing and health schemes, there will be on the part of local authorities more liberal appreciation of these advantages, and a desire for their acquisition as being as important as the provision of other health-promoting means.

The President of the Board of Education suggested that hot water should be laid on to every house. A general hot-water-supply service would be a big task; and it is an idea that is encompassed by heat losses and heavy capital expenditure which mean uneconomy of a large order. There is a simpler way of getting hot water in the quantity and just as required, without premeditation or prearrangement. Up North many cottages and tenements possess gas-heated water-boilers; and everywhere better-class dwellings are to be found with flue-fitted geysers or gas-heated water-circulating boilers. In these subjects affecting health promotion, the war has created a new interest and a lively concern; and an immediately available direction for doing immense good (though the prepayment system of gas supply has already worked wonders) is through the cheaply installed, economically operated, convenient, reliable, labour-saving gas mode of cooking and heating. What the Government must do is to help gas undertakings by every possible means to cheapen gas supply, and not to obstruct such a desirable end. That has been a regrettable mistake in the policy of the Private Bill Authorities, and in defiance of the findings of disinterested and judicial parliamentary investigation.

Inert Constituents and Manufacturers' Agreements.

THE efforts made by corporations and railway companies to prevent the passing of Calorific Standard Orders pending a full investigation of certain technical matters which they have raised, have been futile. The plea that this should be done was submitted to the Board of Trade by Mr. G. J. Talbot, K.C., on behalf of the railway companies, and was supported by the corporations. But the Board, announcing their decision, upon the application, stated that, while fully alive to the desirability of an early determination of certain technical matters affecting the supply of gas generally, they did not feel themselves justified in deferring consideration of the application for Orders under the Standard of Calorific Power Act pending the result of such an investigation. One of the proposals was for the calorific standard to take into account the presence in town gas of inert constituents. It will be seen from this that there is no intention of letting the matter lie dormant, but that, as soon as there is an opportunity, it will be revived, with all the evidence that has been procured by analysis of samples of gas taken here, there, and practically everywhere. The "Engineering Correspondent" of the "Daily Telegraph" referred to the matter last week, and pointed out that percentages of inert gases as high as 30 and more had been found in gas supplies. He spoke of the unfairness to consumers of such an amount of incombustibles, and submitted what is appreciated in the gas industry, except by those who wittingly or otherwise are guilty of this practice, that such procedure is not in the best interests of gas undertakings. This reference in the Daily Press shows that the matter is coursing-out into greater publicity, and is, in fact, getting to the ears of consumers, from whom trouble may be expected. The writer in our morning contemporary goes further, and suggests to manufacturers that, before putting in gas-heated metal-melting appliances, they should have an understanding with the gas undertakings as to the maximum percentage of inert gases permissible in the gas supplied, and that the manufacturers themselves should make analyses and calorific tests of the gas supplied in order to see that they get what they pay and bargain for, which is combustible gas, *plus* the unavoidable quantity of inert gases according to the coal used and the conditions of carbonization. The position to which this matter is being driven is one for which those directing gas undertakings in which care is exercised as to the constitution of the primary commodity will hardly be prepared to thank those gas undertakings that have been found bad and persistent defaulters.

The Statutory Maximum the Only Coal Price.

The Price of Coal (Limitation) Act is particularly well named. The "limitation" is to-day sincere and decisive. In an editorial article last week, attention was called to the fact that, under the newly-issued conditions as to the sale of coal, it is directed that "no coal shall be sold by collieries for consumption in the United Kingdom except at the maximum price under the Price of Coal (Limitation) Act." This direction, we remarked, "appears to be at variance with the intention of the Act, which was to fix a maximum without binding generous coalowners to charge less if they found it possible, and were willing," which is not often the case. From a letter sent out by the Board of Trade, our reading seems to be the one officially intended, the intention being due to irregular external conditions producing in certain coalfields fluctuations of price which disturb the regularity of the distribution of coal. Naturally people want to buy in the cheapest market; and so again economy of rail transport is at the bottom of what struck us as a strange official decree. This is what the letter says: "The Controller's attention has been drawn from time to time to cases in which temporary conditions, such as shortage of shipping, have produced fluctuations in price which have no real justification in the general conditions of the market, and only interfere with the regularity in the distribution of coal which is so desirable at the present time. He considers it necessary, therefore, to instruct all colliery owners that in future, except in cases in which he otherwise directs, prices for inland consumption must remain at the maxima fixed under the Price of Coal (Limitation) Act." A coal contemporary observes that it is something of a surprise to find the Act used to prevent prices falling below the maxima.

Heating Gas and Complete Gasification of Coal.

In Germany, as in this country, consideration is being given to the question of the best methods of developing the industrial load of gas undertakings by the supply of a gas low in inert constituents and of high-flame temperature. But they are not confining themselves to talk; they are working upon the improvement of processes having for their object the complete gasification of coal, and the recovery of the maximum yields of high-class oils and ammonia. One such process is that of the Dellwik-Fleischer Water-Gas Company, about which process information has been given in a paper by Dr. A. Naumann. It is a continuous system—the coal being carbonized in a retort internally heated by gas generated by the plant itself, while the descending coke is gasified in a generator below. The water gas produced, along with undecomposed steam, passes through the column of coal in a highly heated state, thus promoting rapid carbonization and the evolution of the volatile products. The operations (which are described in the paper of which we give a translation in other columns), it is claimed, can be regulated to deal with any class of coal, or to produce more high-grade gas, more oil, or more ammonia. The published paper abruptly cuts off interest. It does not tell us how much gas is produced per ton of given coal; but it does tell us that, according to working conditions, the gas varies in calorific value from 210 to 370 B.Th.U. An analysis of the gas from a "good" coal, too, shows that it contains a low percentage of inert constituents; and the gas is credited with having a higher flame temperature than coal gas, and consequently with affording better utilization of its heating value in all processes requiring high temperature. Another omission is the quantity of ammonia produced; but the general statement is made that yield approaches the theoretical maximum. Particulars of the quantity and nature of the oils are also absent. Cost details are not supplied; but it is mentioned that the process is highly economical, to which general support is given by the statement that, with bituminous coal (unpriced), after deducting the receipts for tar and sulphate of ammonia, the cost works out to 2·04d. per 1000 c.ft., whether including capital charges is not divulged. However, for a gas containing 90 p.ct. of combustible constituents, this is a low cost. With such a process available, Dr. Naumann thinks the German Government should control the use of coal.

Sulphate of Ammonia Price Protest.

It is not astonishing to find the makers protesting against the prices officially fixed for sulphate of ammonia for the season 1917-18. This applies to all producers, but those in the gas industry especially have cause for complaint. Not only has there been for the industry a greatly increased and increasing cost of sulphate manufacture in respect of acid, wages, lime, bags, &c., but high prices and regulated payments hem it in from the beginning to the end of its manufacturing and commercial operations. While gas undertakings have to pay heavily in all directions, they are "sweated" at every point at which they come into contact with Government Departments. It is a curious fact that it should be so, while other industries have an immunity from regulation, from which they are richly profiting. The gas industry does not want to make undue profits; but it does want to be treated fairly. Even for cereals, prices are fixed by Government Departments at relatively high levels; but the gas industry and its fellow producers of sulphate must, it is ordained by Government Departments, supply the artificial fertilizer for the production of these cereals at a price that is inconsistent with manufacturing and other current conditions. The Sulphate of Ammonia Association has passed a mild and courteous protest (printed in other columns), and made suggestions regarding an amendment of price in consideration of the increased cost of sulphuric acid, and consultation when questions of price and other matters affecting the trade are under discussion. It is about time that some really strong and effective action was taken to bring before the authorities the view that the gas industry ought not to be expected to go on with the ill-consideration that it is now receiving. Nothing within reason will it decline to do on patriotic grounds; but it should receive—it has a right to receive—at any rate common justice at the hands of Government Departments. It is refused relief under the sliding-scale, coke exports are regulated, sulphate of ammonia exports are prohibited, the price for sulphate at home is regulated at a low figure in relation to costs, from the regulated prices of benzol and toluol some undertakings earn little or nothing, and accompanying all of this is the huge burden of an industry whose main raw material is coal, as well as the ordinary burdens of the times. We do not see the fairness of a position from which so much is expected by Government Departments, and to which so little consideration is given by them.

Relations between Employers and Employed.

Some days ago an interim report on Joint Standing Industrial Councils was submitted to the Prime Minister by a Reconstruction Committee Sub-Committee on Relations between Employers and Employed. The terms of reference to the Sub-Committee were to make and consider suggestions for securing a permanent improvement in the relations between employers and workmen, and to recommend means for securing that industrial conditions affecting these relations shall be systematically reviewed by those concerned, with a view to improving the conditions in the future. This Sub-Committee is mainly composed of prominent representatives of employers' associations and trade unions; and it is hoped that the proposals put forward, if carried into effect, will have far-reaching beneficial results. Among these proposals is the establishment for each industry of an organization, representative of employers and workpeople, to have for its object the regular consideration of matters affecting the progress and well-being of the trade from the point of view of all those engaged in it—so far as this is consistent with the general interest of the community. In order that this idea may be carried into effect, it is recommended that the Government should at once propose to the various associations of employers and employed the formation of Joint Standing Industrial Councils in different industries in which they do not already exist. It is important to note that, before deciding to adopt these proposals, the Government have invited the general views of leading employers' associations and trade unions—for the suggestions are applicable only to well-organized industries, and have for their object to deal with but one aspect of the problem of industrial reconstruction. The views of these bodies are desired promptly; and then if it is finally decided to adopt the scheme recommended by the Sub-Committee, each of the trades affected will be invited to discuss the best method of putting it into operation. At present the idea is to get from those who have been consulted merely general criticisms and suggestions on a question with regard to which the Cabinet feel that action cannot be deferred until after the war, as it is essential that the problems involved should be fully discussed by the parties before they actually arise.

Municipal Managers and Legal Recognition.

The managers of municipal gas and electric light plants in Massachusetts will plume themselves that they are deemed worthy of special notice by the Board of Gas and Electric Light Commissioners. They will at any rate be in a superior position to the managers of British municipal plants in that they will, if the legislation proposed by the Commissioners be passed, have their position recognized and defined in an Act. The Commissioners have found that a weakness divulged by experience is the insecure tenure of the office of the managers of municipal plants and the pressure which is frequently brought to bear upon them to permit or adopt practices with respect to the conduct of the business, which will in time undermine the efficiency of such plant and the integrity of the public investment therein. Therefore in a Bill which the Commissioners have drafted, it is proposed to enact that the managers of municipal gas and electricity plants shall, under the direction and control of the Mayor, selectmen, or municipal light board, have full charge of the operation and management of the plant, the manufacture and distribution of gas and electricity, the purchase of supplies, the employment of agents and servants, the method, time, price, quantity and quality of the supply, the collection of bills, and the keeping of accounts. More information on the subject will be obtained from the notice of the report in other columns; but, if managers of municipal undertakings on this side had their positions strengthened by legislative recognition in this way, there would be less disinclination on their part to a little more plain speaking to a certain element in some municipal bodies which thinks it part of its functional work to make the office of manager a bed of thorns, and to do its best to ride-down law and order upon the works.

PRESENTATION TO MR. RAYNER.

The July issue of the "Co-Partners Magazine" of the Gas Light and Coke Company reports that on Tuesday, the 19th ult., Mr. Henry Rayner, the late Secretary of the Company, visited Horseferry Road for the purpose of receiving parting gifts from the Company, the Directors personally, and from old colleagues, the Chief Officers of Departments at Westminster. It was a source of gratification to his friends to observe that Mr. Rayner looked in improved health. There was no formal ceremony; but the Managing-Director gave expression to the feelings of those who, having worked together through sunshine and storm for many years, shake hands over the retirement of one of the companionship into well-earned ease. Mr. Rayner made suitable acknowledgment of the presents; but the war-time conditions forbidding the celebration that such an event would certainly have invited in normal circumstances, the episode passed quietly into the history of the Company.

The gift of the Company was a tulip-wood canteen of cutlery and silver, bearing an inscription: "In recognition of forty-two years' devoted work." The personal gift of the Directors was a handsome silver rose-bowl, inscribed, "A mark of their sincere esteem and regard, on his retirement, after forty-two years' zealous service." The Chief Officers' present was a fitted suit case for Mr. Rayner, and a fitted dressing-bag for Mrs. Rayner. The inscription was: "From his colleagues in The Gas Light and Coke Company, as a souvenir of many years of good fellowship and friendship."

Large Gas Water-Heating Apparatus.

It is hardly astonishing, when the contents are considered, that there should have been so extensive a demand for a number of "A Thousand-and-One Uses of Gas," dealing with gas water-heating apparatus for large institutions, as to call for what is practically a reprint. This has been issued, as the July number of the publication, by the British Commercial Gas Association; and it will be found very useful in solving some of the problems arising out of the conditions of business to-day. With temporary hospitals, camps, canteens, and similar places requiring liberal supplies of hot water, springing up everywhere, no gas man can tell just when a favourable opening is likely to present itself; and so it is well to be prepared. Towards this end, the particulars given should assist. The probable requirements are explained; and there are photographs of a number of installations of different kinds, serving varying purposes. The arrangements of apparatus detailed emphasize the extensive character which the demands are liable to assume; and care is taken to point out that institution requirements are always more or less special, and cannot be calculated or gauged, to any useful extent, by comparison with domestic hot-water supplies.

CITY AND GUILDS EXAMINATION PASSES.

To the names of successful candidates in the recent City and Guilds of London Institute gas examinations given in last week's issue, there are a few to be added to-day. There must have been other successes; and we shall be glad to learn of them without delay, so as to complete publication of the names in next week's "JOURNAL."

Gas Engineering.

FINAL GRADE—FIRST CLASS.

Joseph Sparkes, Congleton.

GRADE I.—FIRST CLASS.

Campbell, D. R., New Cross.

GRADE I.—SECOND CLASS.

Alford, W. F., New Cross.
Harris, A. E., South Lambeth.
Sidery, A., Dulwich.

PERSONAL.

Mr. FRANCIS SULLY, of Romford, has been elected to fill the vacant seat on the Board of Directors of the Romford Gas and Coke Company, caused by the death of Mr. W. D. Child.

Mr. ROBERT MARTIN-HOLLAND, C.B., has, it is announced, been elected a Director of the Gas Light and Coke Company, in succession to Mr. J. DOUGLAS WALKER, K.C., who has retired from the Board.

Mr. HENRY HOARE, the Engineer, Manager, and Secretary of the Gisborne Gas Company, New Zealand, has now three sons serving in the New Zealand forces. Arthur Ernest and Sydney Hubert have been for over two years with the Ambulance Section at the front; while the eldest, Sydney Arthur, is now on his way there with the Light Horse Section. Messrs. John Wright & Co.'s Australasian Sales Manager, Mr. CHARLES R. ADAMSON, also has a son fighting in France with the Australian Division; and his eldest son gave up an important position to undertake munition work at Messrs. Vickers', in connection with arrangements made by the Australian Government.

Captain EDRIC W. BROADBERRY, of the 1st/7th Essex Regiment and the R.F.C., the eldest son of Mr. A. E. Broadberry, M.Inst.C.E., of Tottenham, the Immediate Past-President of the Institution of Gas Engineers, was married on Monday of last week, at St. George's, Hanover Square, to Kathleen Mary, eldest daughter of Mr. & Mrs. Samuel J. Griggs, of Dunelm, Loughton. The subsequent reception at the Langham Hotel was attended by many friends both of the bride and bridegroom. Captain Broadberry went through the fighting at Suvla Bay (Gallipoli), and afterwards saw service in Egypt and Sinai. He has recently been doing good work for the R.F.C., in France and elsewhere. In civil life, he was under Lieutenant-Colonel Harold W. Woodall at the Bournemouth Gas-Works; and, being already in the Territorials, he was mobilized immediately on the outbreak of war.

Notification has been received by Mr. J. H. Troughton, of Newmarket, that his second son, Captain JOSEPH E. TROUGHTON, of the West Riding Regiment, has been severely wounded while leading his platoon into action from the trenches, and is in the Second London General Hospital at Chelsea. It is stated that a shell exploded in front of the column, and that he was struck by shrapnel. He was a pupil with Messrs. R. Dempster and Sons, of Elland, when war broke out and he joined the West Riding Regiment (Duke of Wellington's) as a private. He obtained his commission early in 1915, and previous to going to France was on active service at Suvla Bay and in Egypt. We are glad to learn that he is recovering from his serious wounds. His Commanding Officer writes: "He is the most popular officer in my battalion. He is a most competent officer. The men simply love him. Although I have only been with this battalion for a month, I have seldom found any officer who has taken to his work better; and I shall miss him very much indeed."

The position of Engineer and General Manager to the Blackburn Corporation Gas Department, rendered vacant by the death of Mr. A. Morton Fyffe, has been filled by the appointment of Mr. JOHN W. M'LUSKY, the Gas Engineer and Manager to the Airdrie Corporation. Mr. M'Lusky (who is a brother of the Halifax Corporation Gas Engineer) is 34 years of age. His first appointment was as Assistant Gas Engineer to the Renfrew Corporation; but four years later, he became Superintendent of the Barking Gas Company. Later on, after spending three years as Assistant at Bridgwater, he went to Portrush as Gas Manager, moving from there in 1915 to take up a similar position at Airdrie. His professional career has already provided him with a large experience of new works and extensions. While at Renfrew, there were put into operation a new retort-house, with railway siding and coal and coke handling plant, as well as new scrubbers, condensers, and purifiers. At Barking, there were erected a half-million cubic feet spiral holder, and electric stoking machinery and elevating plant; and at Portrush and Airdrie he has had charge of new work of a substantial character. Mr. M'Lusky's appointment to Blackburn was by a unanimous vote of the Gas Committee. The salary is £800 per annum. At the monthly meeting of the Airdrie Town Council, Provost Frew, on behalf of the Council, extended hearty congratulations to Mr. M'Lusky. While they regretted that they were losing his services, they could not, he said, stand in the way of his betterment in life; and he was sure Mr. M'Lusky would leave them with the best wishes of all. A deputation from the Blackburn Corporation visited Airdrie a week or two ago and made inquiries. Mr. M'Lusky, in his letter of resignation, mentioned that it was not without regret that he tendered it, as during the past two years the gas undertaking had achieved excellent results; and in Airdrie he had found great pleasure in his work.

OBITUARY.

BENJAMIN GREEN.

AFTER a connection with the gas industry extending over very many years, during which he accomplished much useful work, Mr. Benjamin Green (formerly Secretary and Manager, and afterwards a Director, of the Mitcham and Wimbledon District Gas Light Company) passed away at a ripe old age last Thursday morning; and to the family keen sympathy will be extended.

Born in July, 1840, at The Delph, near Brierley Hill, Mr. Green, on leaving school at the age of sixteen, entered the service of the Brierley Hill Gas Company, to whom he became Assistant Secretary and Manager. Then ten years later—that is to say, in 1866—he went to Mitcham to take up the position of Secretary and Manager to the Gas Company, which was at that time a small private concern, without parliamentary powers, and having a capital of less than £42,000. When Mr. Green joined the Company, there were two undertakings in the district, one at Mitcham and the other at Wimbledon; but in 1877, parliamentary powers having meantime been secured and the two Companies having been amalgamated, operations were concentrated—an entirely new works being erected at Mitcham under his supervision.

Mr. Green retained his position as Chief Officer of the Company until October, 1911, when he retired, and was succeeded by his son, Mr. B. R. Green; and two months later he was elected to a seat at the Board, of which he remained a member until the amalgamation on Jan. 1, 1913, of the Company with the Wandsworth and Epsom Companies, under the title of the Wandsworth, Wimbledon, and Epsom District Gas Company. Failing health had since that time prevented him from taking any active part in the work of the industry; but he followed with very great interest all improvements and developments which took place. His relations with the staff and workmen of the Company were invariably of the most cordial character; and he was justly proud of the handsome testimonials from them of which he was on several occasions the recipient.

As to his Association work, Mr. Green was a member of the old British Association of Gas Managers (now the Institution of Gas Engineers); having been elected in 1872. He retained membership of the Institution until the date of his death; and for several years he was a member of the Committee of Management of the Benevolent Fund. In addition, he was one of the founders of the Southern District Association of Gas Engineers and Managers, of which also he remained a member until the end. Outside his work for his own undertaking, he was a Director of the Singapore Gas Company from 1892 until it was taken over by the Municipality; and he also devoted a good deal of time to parochial matters in Mitcham, as a member of the School Board and as a churchwarden.

The Manchester Corporation Gas Committee have had reported to them the death of Mr. THOMAS HARRISON, late Chief Deposits Clerk, who was in their service for 54 years.

Gas for Shoemaking.

The prominent place that may be occupied by gas in the manufacture of shoes is shown in an article by Mr. S. S. Amdursky, of the Rochester (U.S.A.) Railway and Light Company, who describes the various processes. Among these, a gas-fired steam-generator furnishes heat for a wax bath, &c., and a water-heater is used for tempering the sole material; while various tools for treating the welt and sole edge are heated by an open gas-flame. Then there is an illustration of a gas-fired air-drier, designed by the Rochester Company to remove (preparatory to sand papering) any moisture which might be left in the sole of the shoe. This drier consists of a galvanized box, having a screen cover; the whole being supported by an angle iron construction. The heater consists of two headers, branch-pipes from which lead into the flue. A burner-tube runs along inside each header, and has as many flames as there are branches—each flame with direct access into each branch. Baffle-plates direct the flow of the heated air uniformly. This particular drier replaced a steam-heated one; and it is found that, owing to the regular temperatures, the shoes taken from the gas-heated drier are in a much better condition and shape for sand papering than with the steam-heated drier. Also, while the speed of the operation is practically doubled, the heat may be controlled at will. The products of combustion do not come in contact with the shoes; and the design is such that one-half only of the drier may be used, if desired. The moment the drier is not required, of course, the gas is shut off, and the fuel cost ceases.

INSTITUTION OF GAS ENGINEERS.

A Special General Meeting.

ON Thursday afternoon last, a Special General Meeting of the Institution was held at the Institution of Civil Engineers, Great George Street, S.W., for the purpose of submitting for confirmation an alteration to the Articles of Association which was passed at the annual meeting last month, and to elect two honorary members. Mr. SAMUEL GLOVER, of St. Helens, occupied the chair, in the absence of the Rt. Hon. Lord Moulton, K.C.B., F.R.S. (the President).

AN ALTERATION IN THE ARTICLES.

The CHAIRMAN explained that it was a formal meeting of the Institution, called by a notice which had been sent out to the members; and, in the absence of Lord Moulton, the President, he had been asked to take the chair. The first item of business was the alteration to the Articles of Association; and he thought their minds were clear as to the purport of the amendment. The Council were anxious that there should be no doubt whatever as to why the alteration was sought to be made.

Mr. A. E. BROADBERRY (Tottenham) said it was his pleasure and privilege to propose that the alteration to Article of Association 50 (*f*) be confirmed. They would remember that the alteration, which was as follows, was passed at the annual meeting on June 5:

> "That the last sentence of Article of Association 50 (*f*) be deleted and the following words substituted: 'or any other person interested in the gas industry who may be elected to such Committee by the Council of the Institution.'"

The object of the alteration was a very simple one. They all of them knew that at the present time it was desirable that they should be in a position to re-constitute the government of the industry; and, with this end in view, it was necessary that they should invite others who were not members of the Institution to confer with them. But although under the existing Articles of Association they could ask them to come to a meeting, they would have no power to vote at the meeting—which would place them in a somewhat invidious position. The Council wanted to do away with every possible cause of friction; for it was desired that any alteration which might take place in the constitution of the Institution itself and the general government of the industry should be carried out with the utmost harmony. ["Hear, hear."] Therefore the idea of the suggested alteration was that those gentlemen who, not being members of the Institution, might be asked to join any Sub-Committee to confer on any subject of general interest, should not only have the right to attend a meeting to which they were invited, but should also have the power of voting at the meeting. Everybody would, he was sure, agree that at the present moment, when there were such great possibilities in front of the industry, it was necessary that every practicable step should be taken to create a combined body that was perfectly harmonious; and this was the first step towards so desirable an end. He had, therefore, much pleasure in proposing the confirmation of the resolution which had already been passed.

Mr. JOHN YOUNG (Hull) said he had very much pleasure in seconding the motion. The proposed alteration was carefully considered at the annual meeting, and approved, and had now been ably explained by Mr. Broadberry. It was, he felt sure, a step in the right direction.

Mr. C. E. JONES (London) remarked that, as a member of the Institution under its various names for 43 years, he rose to support the motion. It would be within the recollection of some of them, but not of all, that about 33 years ago the Institution adopted a policy of exclusiveness, and reorganized itself on lines which he, and friends of his, then opposed. They brought about some modification of the arrangement; but they did not succeed altogether in keeping the portals of the Institution open to all those of scientific attainments and otherwise interested in the Institution. This policy, he was proud to say, was now upon its death-bed, and was about to be altered. A more disastrous thing for the gas industry, with its manifold ramifications, than was carried out at that time, he could not imagine; and he rejoiced that he had lived to see the day when the commonsense of the Institution had prevailed, and they were going back to the safer and much more liberal lines of the old organization. The policy of restricting the Institution to certain members, whatever their qualifications might be, so long as they held the requisite position in a gas-works, had shown the difficulty of drawing hard-and-fast lines, and making cast-iron rules, to keep out everybody except those who happened to be in charge of gas-works. They had among them men of considerable ability, and they had scientists of unquestionable honour. Many of them, fortunately for this country, were engaged in trade; but unfortunately for themselves, the Institution had said: "You are a trader, and so you cannot enter our portals." This was a thorough mistake. It was quite inimical to the true interests of the gas industry and to the advancement of science all over the world. With a united industry, all striving for one great object, there was a large area awaiting investigation. There was a very wide field indeed waiting for cultivation. Some fifty or sixty years ago, the science of chemistry was in a dormant state, when suddenly the enormous facilities afforded by the gas industry rejuvenated the science of chemistry. Even to-day it was but partially developed; and its field was in the industry to which those present had the honour to belong. They had taught the whole world how to array itself in beautiful colours. This was due to the gas industry. They had also enlightened the ways of the world. This was due to the gas industry. And they would have made still greater progress if they had not been hampered by the jealousy of the governing bodies, and in some instances by the shortsightedness of their own governing body. But for this, they would have occupied a still higher position to-day than they did. He therefore rejoiced that they were now in a position to congratulate themselves upon emerging from the cast-iron rules that were imposed upon them over thirty years ago. He felt sure he was only echoing the views of his friends and the Institution generally in expressing the hope that, under such an illustrious President as they now had the honour to serve, they would see an immense stride forward taken. In the various branches of science there was much for them to do; and he was perfectly satisfied they were moving in the right direction by carrying this resolution and abolishing the exclusiveness to which he had alluded. He therefore supported most warmly the resolution before the meeting.

The CHAIRMAN said that if the proposal needed any further support, it could be given by those of them who had been identified with the work of the Council. In many cases they had co-opted men, who came and worked on a Committee; and it had been found that they felt their position was less dignified than it ought to have been. When this resolution was passed—as he had no doubt it would be—it would prevent them from being in the position that they could invite people to come to committee meetings, and yet could not ask them to join in the voting on the question they might be discussing.

The resolution was then carried unanimously.

Sub-section (*f*) of Article 50 will now read that the Council may

> Appoint Special Committees for investigation into matters connected with the manufacture and application of gas, or otherwise for special purposes in furtherance of the objects of the Institution. They may delegate to such Committees such of their powers as they shall think fit; but such Committees shall be subject to their control, and shall not expend any funds of the Institution other than such as have been voted for their use by the Council. Such Committees shall consist of persons on the register or list of the Institution, any such person, whether a member of the Council or not, being eligible, or any other person interested in the gas industry who may be elected to such Committee by the Council of the Institution.

TWO NEW HONORARY MEMBERS.

The CHAIRMAN said there was another item of business to put before the members. When he first received the notice of meeting, and read that they were to have the President with them that afternoon, he was delighted; but unfortunately Lord Moulton was not able to be present to propose the next resolution, though he had promised to meet the Council afterwards. He (the Chairman) had therefore to propose the election as honorary members of the Institution of the two gentlemen whose names had been put before them. The Council unanimously supported the proposal. They were convinced they were doing the right thing—honouring themselves as an Institution, while at the same time giving honour, so far as they could, to those whom they were inviting to become honorary members. The first name was that of Dr. Frederick Mollwo Perkin, F.I.C., son of the late Dr. Perkin, who was the inventor of that wonderful series of dyes of which Mr. Jones had just reminded them. The other was Mr. D. Milne Watson, M.A., LL.B., the Managing-Director of the Gas Light and Coke Company, who was known to all of them, and respected for his good work in the interests of the industry. These gentlemen had felt it an honour to be invited to become honorary members of the Institution of Gas Engineers; and he therefore had much pleasure in proposing that the action of the Council in bringing their names forward be confirmed.

Mr. THOMAS BERRIDGE, in seconding, remarked that both gentlemen were well known, and had done the Institution an honour, which the members would fully appreciate, by their acceptance of the invitation extended to them.

The resolution was unanimously agreed to.

CERTIFICATION OF GAS UNDERTAKINGS.

The CHAIRMAN then read the following letter from the National Gas Council on the subject of the certification of gas undertakings.

[The letter had reference to the resolution unanimously passed at the annual meeting of the Institution, requesting the "Committee of the National Gas Council charged with the question of labour in gas-works to urge the Dilution Department of the Ministry of Munitions to apply the schedule of protected occupations to all gas undertakings." It was written in response to an application by Mr. Walter T. Dunn, the Secretary of the Institution, for the latest information available on the subject.]

CERTIFICATION OF GAS UNDERTAKINGS.

Sir,—I beg to inform you that this question has been referred to the Ministry of Munitions, who have advised the Council that it is a matter for decision by the War Cabinet. Up to the time of writing, no ruling has been announced.

From information before the Council it is clear that many gas

undertakings are receiving protection cards for their employees though not certified; and they are thus placed in a similar position to certified undertakings, and will be dealt with at the discretion of the Dilution Officer of the Munitions Area.

The difference between the red and black cards appears to be very slight, both being subject to withdrawal at short notice.

(Signed) W. J. SMITH,
July 4, 1917. Secretary to the National Gas Council.

This was followed by an informal discussion, which brought the proceedings to a close.

OPERATING CARBURETTED WATER-GAS PLANTS FOR THE PRODUCTION OF BLUE WATER GAS.

IN view of the present interest in the use of carburetted water-gas plants for the manufacture of blue water gas, the following notes have been compiled and are issued by the Council of the Institution of Gas Enginners.

Up to the present time, practically all water-gas plants in gas-works in the United Kingdom have been operated for the production of carburetted gas; but every such plant is primarily a blue-water-gas generator, and can be operated without any structural alteration for blue-water-gas alone. It requires only a re-adjustment of generating conditions—*i.e.*, principally in the rate and the period of blasting and steaming, and the height and the character of the fuel bed.

As heat is not required in the carburetting chambers when oil is not being used, the object to aim at for economical working is to minimize the waste of heat due to the volume of CO_2 and the quantity of sensible heat in the blast products. This requires, in practice, slow steaming and quick blowing; and this is effectively accomplished by altering the timing of the cycle.

The general character of the fuel—as to hardness, content of ash and moisture, &c.—has an important bearing on the working results of all plants; but as a rule, the cycle which gave the best results in working for carburetted water-gas production should not be too radically altered when starting blue-water-gas production. To begin with, the adoption of a somewhat shorter cycle, with the fuel depth unaltered, is the best step to take. For example, if the customary cycle for carburetted gas has been (say) three-minute "blows" and five-minute "runs" a trial with two-minute "blows" and five-minute "runs" is advisable—keeping the CO_2 content in the finished blue gas below 6 p.ct. The CO_2, if too high, may be reduced by cutting-down the steam, or the length of the steaming period, or by a longer or stronger blast. The resultant fuel consumption is a good guide for any further adjustment which may be found necessary.

It is always important to use in the generator coke of suitable size, in as dry a condition as possible, and free from dust and breeze.

The analysis of blue water gas is approximately as follows:

Hydrogen	50·5
CO	38·5
CO_2	6·0
N	3·5
CH_4	1·0
H_2S	0·5
	100·0

The calorific value is about 300 B.Th.U. gross.

In considering the admixture of blue water gas with coal gas, it is essential to have regard to the diminution of calorific value of the mixture. In many cases, it will be found necessary to increase the calorific value of the coal gas, which for an admixture of 20 p.ct. of blue water gas (*e.g.*, 80 p.ct., of coal gas, 20 p.ct. of blue water gas) should not be lower than 540 B.Th.U. The blue water gas, with not exceeding 6 p.ct. of CO_2, should be about 300 B.Th.U. The calorific value of the mixture will thus be a little over 490 B.Th.U.

In respect to the distribution of the mixture, it is of the highest importance that the percentage and qualities of the mixed gases be maintained as constant as possible, and any changes in the proportion should be made gradually.

In carrying out the above suggestion, should any difficulty arise which cannot be accounted for, it would be advisable to bring the matter to the attention of the makers of the plant.

Restrictions Regarding Machine Tools.—The Minister of Munitions calls attention to the fact that, under the Defence of the Realm Acts and Regulations, no person is allowed to sell, purchase, hire, or loan, or send on approval, any new or second-hand machine tools, without the permission in writing of the Ministry of Munitions. Applications from intending purchasers should be addressed to the executive officers of the Area Clearing Houses, the addresses of which can be obtained by application to the Central Clearing House, Charing Cross Building, London, W.C. 2. Applications for permission to sell should be addressed to the Machine Tool Department, Charing Cross Building, Villiers Street, Strand, W.C. 2.

ELECTRICITY SUPPLY MEMORANDA.

THE view changes in connection with the Electric Power Supply Committee. It has been doing so weekly since the appointment by the Board of Trade; and even those annotators on electrical events who at first saw the opening of the high road to electric salvation at the portals of the Board of Trade are dropping into line with those who detected in the constitution of the Committee something defective, and with those who now fancy the Committee is something in the nature of a trap—the divined object being the wholesale annihilation of numerous municipal undertakings and the scooping of their interests and affairs into a few new octopus-like creations. It is not fashionable these days to side with autocratic bodies or movements; and electricians are looking very suspiciously upon the proceedings of such an embodiment of absolutism as the Board of Trade, who, it appears they have rarely known to do good save by accident. As was announced last week, the result of the press and local authority agitation over the composition of the Committee has been to move the Board of Trade to concede three additional representatives to the municipalities. But there came another rude shock The municipal side of the electrical industry is very anxious to have men who can throw weight into the balance against the electrical experts already upon the Committee. The Board when seeking to get nominations from the Municipal Corporations Association, the Urban District Councils Association, and the Incorporated Municipal Electrical Association, ventured to suggest that their nominees should not be engineers. The Association of Municipal Corporations went and at once put forward the name of Mr. Harold Dickinson, the City Electrical Engineer of Liverpool. The upshot is that the Board of Trade have added to the Committee Mr. W. B. Smith, of Glasgow, Mr. Dickinson, and Mr. E. F. Vesey Knox, K.C. They have also secured Sir Archibald Williamson, Bart., M.P., as Chairman, in place of the Right Hon. F. Huth Jackson, who resigned on medical grounds. What the municipal authorities are still fearing is that the constitution of the Committee means a confiscation of some of their rights and privileges, and the furtherance of the large concentration policy. In other words, there is a sort of plot hatching to push them out, and to bring the whole electrical supply of the country under the domination of large companies—leaving possibly the local authorities to be nothing more than distributors and salesmen. Not many days ago, electrical generating concentrations on the large scale were the one thing needed. But to-day it is seen that it makes all the difference who is going to govern the concentrations. The municipal authorities at the present time control a very large part of the electricity supply industry; and, providing there is no change in general legislation, they would (if desired) ultimately come into possession of the whole of the company undertakings. They feel they are now to be put on their trial. The very fact that the inquiry is into the question of the provision of cheaper electrical energy is in effect an indictment of their management and of the system under which they operate; for obviously it is the opinion of the Board of Trade that the local authorities have not succeeded in five-and-thirty years' development in providing electrical energy at the price at which it is needed. Meanwhile, in so far as there is any manifestation, the electrical companies are sitting watching the play, without taking any part in it.

Dark Designs.

No Definite Policy.

But there is no doubt they are quietly preparing themselves for the inquiry; and when wanted they will be there, and fully armed. We learn that the Municipal Corporations Association the Municipal Electrical Association, the Urban District Councils Association, the Institution of Electrical Engineers, and the Association of Electric Power Companies, as well as commercial organizations, are preparing to give evidence; and the British Empire Producers' Association are at present collecting information from the industrial side. This organization has already submitted to the Committee that "the class whose views are deserving of prior consideration consists of the manufacturers throughout the kingdom, whose business is likely to be affected, particularly with international competition after the war, by the efficiency and cheapness or otherwise of electric power distribution. . . . The industries of the country will not be able in the coming period of international competition to afford the continuance of such handicaps as excessive charges for power." The Special Committee of the National Gas Council who are watching current developments as they affect the gas industry will note this expression of opinion, and probably meditate upon, and take action in regard to, the part that the gas industry can or should take to meet the requirements of industry. We seem in the gas industry to be as badly off for a well-defined policy as the electricity industry—if not more so. However, the Committee will doubtless hear that the manufacturers of the country have the very virtuous and human desire to get power for their works as cheaply as possible; and the Committee will possibly hear all sorts of untried schemes propounded whereby the generation and distribution of energy can be carried on at a cheaper rate than now; and, from the medley of view, they will draw their own conclusions, which it will not be surprising may be those already

held by the strongest electrical men on the Committee. Mr. T. Roles, of Bradford, sees the electricity industry floating aimlessly on the tide of current events; and at the recent meeting of the Incorporated Municipal Electrical Association, he—shrewd observer that he is—appealed for the formulation of a definite policy. The "Electrical Review" endorses Mr. Roles' appeal in an article headed "Wanted, a Policy." But for the life of us we are not at all clear (after reading it) to whom the "Review" would, if it had its way, confide the provision of the cheaper electricity—whether to municipalities or companies. It certainly is not to the latter, because our contemporary says: "It may be many years before the latter [the companies] will find in cheaper electricity supply a source of dividends. Nevertheless, cheap electricity is a need of the hour, and 'for all' should be the motto of the supply industry of the country." But after all what is "cheap electricity supply"? Cheapness must not assail sound business principles, and it must not be obtained by following the rascally process at present pursued by a number of local authority electrical undertakings of making the ratepayers generally pay part of the cost of providing the electricity requirements of a section only of the ratepayers. On the other hand, the cheapest electricity supply is not to be obtained by making profits for the relief of the rates. The gas industry could furnish, if the electricity industry desires it for the Committee, some information as to the development of this vicious practice, which is only nascent in the electrical industry, but is very full-blown in the gas industry. If, as a result of the Committee's investigation regarding the influences operating for and against cheap supply, such things are no longer tolerated in municipal electrical trading, then they must not be in the case of municipal trading in gas supply.

Hackney Dissatisfied.

According to Mr. L. Robinson, the Borough Electrical Engineer of Hackney, the preferential charges case which the Gas Light and Coke Company have invited his Council to settle with them in the Law Courts is likely to come on for hearing this month. The event has taken long enough to be brought to a head; but it has given the Hackney Electricity Department and their friends more time to tout for contributions to the costs of the defence. Some £1000 has been promised; but Hackney is far from satisfied. Mr. Robinson refers to it as "meagre support;" and in his resentment, he charges the municipalities of the country with want of cohesion. That is too bad. What he calls "want of cohesion" in this particular matter may be due to prudence, or it may be that other municipalities have their own views as to whether certain procedure is actually breaking the law. Mr. Robinson must allow other men to have a point of view different from his own, and to act accordingly. The Local Government Board, too, refuse to sanction such expenditure, and prefer to leave the matter to the District Auditors, when the accounts come up for their investigation. There are visions of surcharges in some quarters. However, there was another attempt to whip-up the unsympathetic and the laggards at the meeting of the Municipal Electrical Association. The Council stated in their report that they consider the Hackney people have a very good case. In their wisdom, they thought so, too, in regard to Ilford; but legal authorities higher than the Council of the Association ruled otherwise. Despite this declaration of opinion, and the appeal of Mr. Robinson, we have not heard of the letter-box at the Hackney electricity offices bursting with the rush of subscriptions from contrite local authorities.

To Cheapen Electric-Cookers.

The question of the standardization of the electric-cooker is again to the front—the National Electric Light Association of America having brought it there. The electrical people have come to the conclusion that they have quite enough to contend with in the low thermal value of a unit of electricity without having expensive appliances to act as a drag upon the business, with the heavy expenses for maintenance and expert attention. They find that the old shrinkage-of-meat fable and all the other supposed superior virtues of electricity are not sufficient to persuade people to transfer their custom; while the gas industry have a pretty good pack of experience of householders who have considered they have been foolish in giving credence to the various electrical tales. [By the way, we have it from one who knows something about catering that during the recent hot weather undercooked meat suffered deterioration, and became unfit for human consumption, much quicker than well-cooked meat.] The direction of view to-day is shown well by one of the most sensible points we have seen on this subject in the "Electrical Review." It says: "It is obvious that complete success will not result until electric cooking is regarded as an essential and familiar feature of the home. To the instructive requirement of cooking service, so successfully fostered by the gas industry in this country, must be added a preference for electric cooking service, which must be made available on similarly easy terms." That is one of the goals. It shows an enlightened appreciation of the facts of the position. It indicates, too, what a long way the electrical industry has to go. One way in which the American Sub-Committee on Electric Range Standardization proposes to cheapen the electric-cooker is by standardization and a reduced number of models; and another way is to dispense with all superfluous parts, which have been so strongly advocated here to save wasteful use and (as far as possible) difficulty. The recommendations comprise two fundamental types: (1) A cabinet range, with canopy, three boiling-plates, an oven at right or left, and a warming closet; and (2) a flat-top cooker with a minimum of two boiling-plates (33 in. above the floor-level), and an oven below. The writer of "Cooking and Heating Notes" in the "Electrical Times" regards the latter as objectionable, because the oven is at too low a level, "which is neither convenient nor desirable from the user's point of view, and is merely a survival of the gas-cooker." Apparently he would prefer the oven mounted on legs, under which circumstance we would suggest that he should gain a little experience as to lifting heavy saucepans from the higher top, to settle the question of convenience and desirability from the user's point of view. Proceeding, we read that the Sub-Committee proposes three sizes of oven, the smallest to measure 18 in. × 12 in. × 12 in., and the largest 18 in. × 18 in. × 14 in. Grills should be rated at 1800 watts, and should have a working area 12 in. square. A built-in terminal box is not considered as an essential—only adding to the manufacturing cost. Separate fusing of boiling-plates is advocated, but pilot lamps are not regarded as necessary. A socket should be provided on the range, from which the user can supply portable devices—such as coffee percolators, toasters, or irons. Switches for cookers should be standardized; and the labels on the indicating dials should read "High," "Medium," "Low," and "Off," the "Off" being different from the running indications. Separate heaters for the warming closet can be avoided by placing it against the oven. These are among the principal methods by which the American Sub-Committee contemplates making electric cooking available and popular.

Comparative Costs of Electric and Gas Cookers.

But can electricians ever get the costs of manufacturing electric-cookers down to those of gas-cookers? It is evident the Hughes Electric Heating Company of Chicago, do not think so; for they find the work and materials involved are incomparable. This Company (according to the "Electrical Times"), in announcing a further addition to their list prices, state that within the past year labour costs have risen by 32 p.ct., the price of resistance wire by 150 p.ct., the value of porcelain bricks by 150 p.ct., and that of steel by no less than 350 p.ct. The Company also point out the reasons for the greater cost of an electric-cooker compared with a gas-cooker. In an electric cooker there is all the material that is found on a gas-range with the exception of the burners and taps. In addition, however, boiling-plates on a Hughes cooker cost £4 15s., oven elements are listed at 50s., switches cost 40s., fuses are worth 12s. 6d., and connecting wires, terminals, insulation, and so forth are provided to the value of between £2 and £3. In a Hughes oven element there are 198 parts and 172 electric spot welds, while each element passes through the hands of nineteen skilled workmen. Not only does the electric-cooker require more than twice as much equipment as that carried by a gas-range, but the labour engaged upon its construction is "paid for at a much higher rate." "The relative costs of an electric and a gas cooker cannot be compared any more than can the respective prices of a motor car and a pony trap." This is a candid confession; and it shows that, whatever is done, electric-ovens can never hope to reach the low costs of gas-cookers. And a pennyworth of half-a-crown gas will give nearly five times the thermal value of a unit of electricity!

The Contradictions of Experience.

It is really marvellous how the gas industry makes any progress at all, seeing that electrical assertion has it that every utilization of gas is so wonderfully inferior to electricity. We often smile at the queer confidence of writers on electric cooking and heating topics, at their contradictions of experience, and at their belief in the swallowing capacity of their readers. Not long ago we read that gas-heated devices are "unpracticable and dangerous—even in a marquee." This is strange seeing that gas is often run to temporary places for the purpose of providing heat for cooking or tea making. Of course, electricity offers "a ready solution" for such work. Not long ago we saw recognition made of the fact that gas-heaters and coke-boilers are used for hot water supply, but it was alleged that "they are costly to run, and have many disadvantages to which users will testify—such as smell, dirt, and fire risk." Do these allegations explain why gas and coke heated boilers are so popular, and number their patrons by hundreds where electric water heating can number its patrons by ones and perhaps by cyphers? At the time war broke out, manufacturers were being rushed for gas water-heaters, and gas companies and municipal gas departments had not the fitters with which to keep pace with demand. Yet the electrical man declares they are costly to run, and have many disadvantages! Poor fellow! We will undertake, if the person who deals out such absurdity cares to be a sportsman, to beat him in cost and time at water heating—he using electricity, we gas, and without the described disadvantages. As to fire risk, only the other week we had been reading of fires that have recently occurred through electrical agency, and curiously a few minutes afterwards stepped into an "A.B.C." shop the door of which had been receiving unmerciful attention at the hands of the representative of the Metropolitan Fire Brigade. Inquiry disclosed a wire fusion.

THE HYDRAULIC REGULATOR CONTROLLING STEAM-DRIVEN EXHAUSTER ENGINES.

By E. DAVIES, of Birmingham.

THAT the hydraulic regulator has proved a boon to exhauster engine-men in obviating the continuous manipulation of the steam-valves, and also to gas engineers in maintaining an even vacuum, is an established fact. It is, however, such a sensitive piece of mechanism that a few observations on the various points affecting its successful working may be of general interest; for when the regulator gets oscillating, it is a source of trouble in both the exhauster-house and retort-house, as the exhauster is running dead-slow one moment and racing the next, and instead of the two or three tenths of an inch maximum vacuum range that the makers claim for it, the register chart will be found to be blurred from 1 in. to 1½ in. range, as if painted with a brush.

It has been proved in some works that when working in conjunction with retort-house governors, a reaction is set up—the slightest dancing of the latter causing a pronounced oscillation of the regulator bell-float, and cases have occurred where gas undertakings have, on account of this, had to discard either the one or the other.

Should the chart commence to show a gradual incline or a series of steps, it may be taken for granted that the bell-float in the enclosed tank of the regulater has become water-logged—probably by a number of pin-hole corrosions on the water-line. In some instances this has been overcome by painting the block-tin float with a good bitumastic paint, or by making a new bell of galvanized material. But if the regulator be re-sealed periodically, there is less liability of the water becoming putrid and causing corrosion. The re-sealing is an act requiring patience, as any surplus water above the working level has to be allowed to dribble through the overflow before putting the regulator to work again—the engine-man controlling by hand while this is being done, unless another regulator is available.

Although the regulator can be controlled direct on the exhauster inlet, the ideal method is by a pipe connected to the foul main in the retort-house; and if this latter building is at a considerable distance from the exhauster-house, the pipe should be of ample area and be provided with fall and syphon pots to prevent condensation causing water-logging. It is advisable to occasionally examine the connection into the retort-house foul main, as it is very apt to get choked there. At gas-works where air-compressors are installed, it is a good plan to make use of a spare length of flexible air-hose pipe, and blow the vacuum pipe through when the regulator appears to be working sluggishly.

The stand-pipe actuating the bell-float should have a U seal or water drain attached at its base under the exhauster-house floor, to release any water getting over and to prevent any liquid getting into the vacuum control pipe.

It is absolutely essential that the lever bosses, fulcrum stud, faces of washers, and all mechanical working parts should be kept well lubricated and in true alignment, as the least stiffness of any of these renders the regulator inoperative.

The makers' instructions regarding the lengthening or shortening of the union-screw rod when more retorts are being put to work or let down require to be carefully observed.

Another cause of stiffness of working may be due to the gland packing of the steam throttle-valve; and graphite lead fibre packing has proved to be the most suitable for minimizing the friction. The steam throttle plug also may become scored longitudinally and requires periodical inspection.

In large works, where two or more retort-houses may be charging simultaneously, it has been found more advantageous for the regulator controlling efficiently to alternate the charging—especially when all the retort-houses connections branch into one trunk main.

The air escapement cock, placed in the cover of the sealed tank, plays an important part in the successful working of the regulator; and it is necessary to adjust it to a suitable position, which varies in different works.

Sudden fluctuations in the steam-pressure upset the maintenance of an even vacuum; and the hydraulic regulator works much more satisfactorily if a steam-reducing valve, set slightly below the known minimum boiler pressure, is placed on the steam-admission side of the exhaust plant.

The loose adjustable collar on the rod of the bell-float is to prevent the bell grounding on the tank bottom; but it should be set so as to always allow the throttle-valve to pass sufficient steam to keep the engine moving when the collar comes in contact with the tank cover.

The adjustable screw in the tank cover is to prevent the float rising too high; but neither this nor the above-mentioned loose collar should be used for curtailing the travel of the float to any great extent, as it will merely rob the regulator of freedom of action, and provide a sure source of oscillation.

Calorific Standard Application and Order.—The Board of Trade have received an application from the Redditch Gas Company for a calorific standard of 500 B.Th.U.; and they have made the Order asked for by the Guildford Gas Light and Coke Company.

COAL TRANSPORT AND DISTRIBUTION BY RAIL.

Official Details of Coal Controller's New Scheme.

[See Areas Map, Explanatory Notes, and List of Areas Counties on pp. 64-66.]

WHEN Mr. Guy Calthrop addressed the Institution of Gas Engineers on June 6 [see "JOURNAL" June 12, p. 500], he hinted that a scheme for the distribution of coal in a way that would conserve transport facilities to a very large extent was being evolved. This scheme, estimated to save no less than 700 million ton miles annually in the transport of coal by railway, has now been promulgated.

There is no need to emphasize the point that the war is largely one of transport, yet while by no means overlooking the fact that transport on the various fighting fronts is of first importance, it would be a great mistake if it were thought that the transport in Great Britain is not also of the utmost importance. Munitions of war and food have to be transported at home. Hence the imperative necessity for doing everything possible to assist in carrying out the new scheme of the Coal Controller, which is based on the principle of utilizing coal to the largest possible extent near to its place of origin, and so avoiding overlapping in the distribution of it, which, of necessity, goes hand in hand with much useless transport.

Before giving the precise details of the scheme, it may be stated that it aims at dealing solely with what is known as long-hauled traffic; but later on, when the interests affected have been adequately dealt with, it is hoped to extend the same principle and the same operations to short-hauled traffic.

SCHEME OF PRODUCING AND CONSUMING AREAS.

Under the scheme, Great Britain has been divided up into twenty areas, some of which, as is seen from the schedule given below, are purely coal-producing areas, while a few are coal-consuming areas.

Area of Production.	Areas to which the forwarding of Coal by Public Railway for Inland Consumption is confined under the Coal Controller's Scheme.		
	Steam and Manufacturing.	Gas and Coking.	House.
No.	Area No.	Area No.	Area No.
1. Northumberland	1, 2, 3	1	1, 2
2. Cumberland	2	2	2
3. Durham	2, 3	2, 3	2, 3
4. Lancashire	4, 6	4	4
5. Yorkshire	3, 4, 5, 7, 8, 10, 11, 14, 16	4, 5, 7, 8, 10, 11, 13, 14, 16	4, 5, 7, 8, 10, 11, 14, 16
6. North Wales	6	6	6
7. North Stafford	6, 7, 9	7, 9, 10	6, 7, 9
8. Eastern Counties.	—	—	—
9. Shropshire	9, 12, 13	9, 13	9, 12, 13
10. Birmingham and District	9, 10, 11, 13, 14	—	9, 10, 11, 13, 14
11. Northants to Essex	—	—	—
12. South Wales and Monmouthshire	12, 13, 14	12	12, 13
13. South-Western Counties	13	13	13
14. South-Eastern Counties and London	14	14	14
15. Derby and Nottingham	4, 6, 7, 8, 10, 11, 13, 14, 15, 16	4, 7, 8, 10, 11, 14, 15, 16	4, 6, 7, 8, 11, 14, 15, 16
16. Leicester	10, 11, 14, 16	—	10, 11, 14, 16
SCOTLAND.			
17. South-Eastern	17	17	17
18. North-Western	18	18	18
19. North-Eastern	17, 18, 19	19	17, 18, 19
20. South-Western	18, 20	20	20

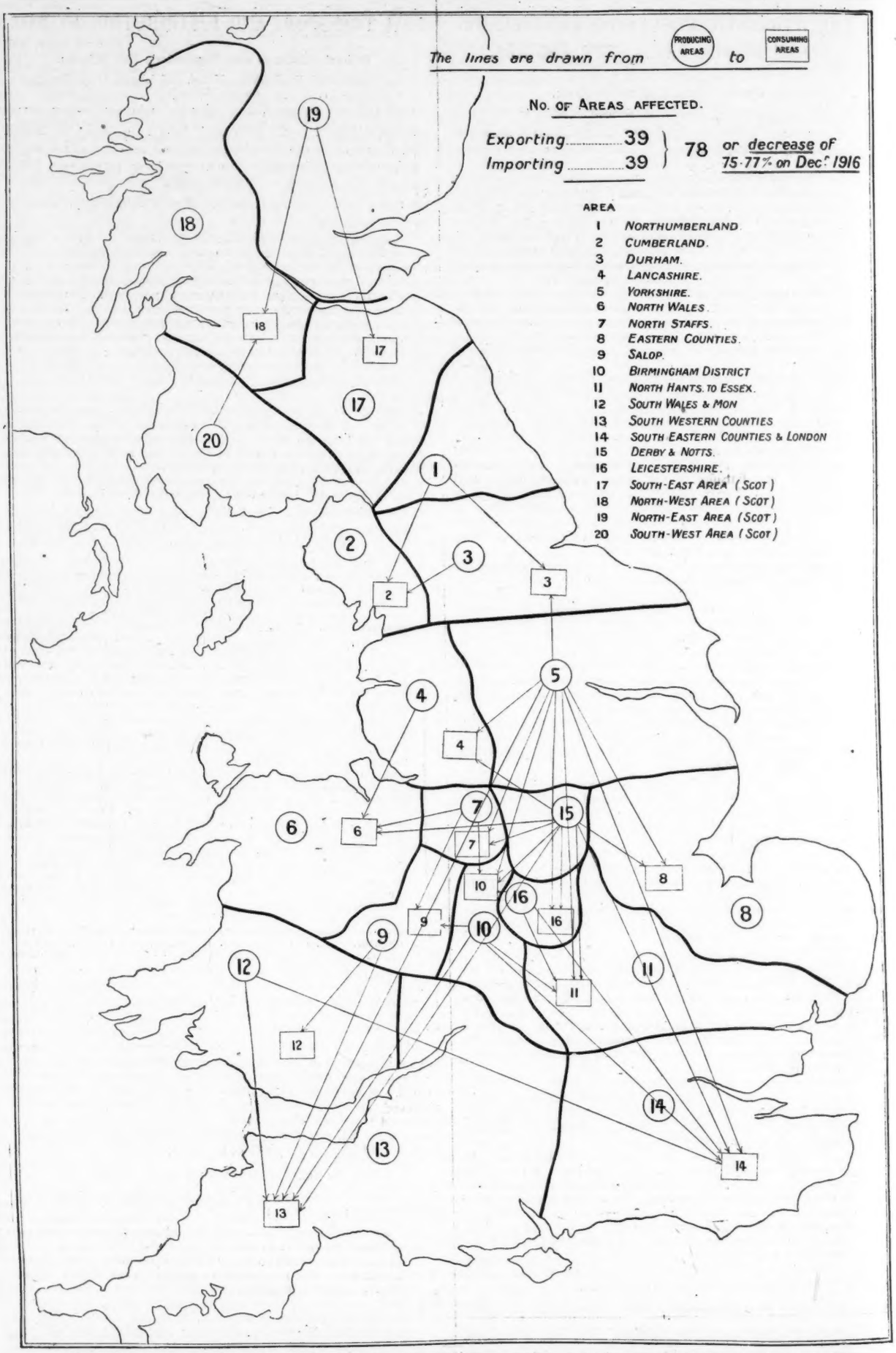
The movement of coal inside the twenty individual areas, or coal produced and consumed in the same area, remains undisturbed, and contracts will not require to be cancelled. It will be observed that the scheme bears chiefly upon coal which is being conveyed for long distances or cross-country journeys; both circumstances being prolific sources of trouble in view of depleted railway staff and rolling stock of all kinds.

PRINCIPLES GOVERNING THE SCHEME.

The object of the scheme being to reduce the long haul, it is based on four main issues:

(1) That the consumption of coal should take place as near the producing point as possible.
(2) That, in view of the superior facilities afforded by the main trunk lines, the movement of traffic should follow these routes wherever possible.
(3) That the movement of coal should, as far as possible, be in well-defined directions—viz., North to South, North to South-East, North to South-West, and East to West.
(4) That an area producing less coal than suffices for its own needs should not send any portion of its output to other

[Continued on p. 66.]



SKETCH MAP SHOWING INTERCHANGES BETWEEN PRODUCING AND CONSUMING AREAS OF RAILBORNE COAL (EXCLUDING ANTHRACITE) FOR INLAND USE UNDER THE COAL TRANSPORT REORGANIZATION SCHEME.

[Prepared and Published by the Railway Clearing House for the Board of Trade—Controller of Mines.]

LIST OF DISTRICT COAL AND COKE SUPPLIES COMMITTEES RESPONSIBLE FOR THE VARIOUS AREAS.

Area.	Secretary of District Coal and Coke Supplies Committees.
No. 1 (Northumberland) . . .	R. Guthrie, Esq., Coal Trade Office, Newcastle-on-Tyne.
,, 2 (Cumberland)	T. P. Martin, Esq., 19, Falcon Street, Workington.
,, 3 (Durham)	R. Guthrie, Esq., Coal Trade Office, Newcastle-on-Tyne.
,, 4 (Lancashire)	Sir T. R. Ratcliffe Ellis, 18, King Street, Wigan.
,, 5 (Yorkshire) South Yorks. Collieries	Messrs. Parker, Rhodes, & Co., 14, Moorgate St., Rotherham.
West Yorks. Collieries	A. B. Smith, Esq., Central Bank Chambers, Leeds.
,, 6 (North Wales)	W. H. Haswell, Esq., Elwy House, King Street, Wrexham.
,, 7 (North Stafford) . . .	Major J. Selby Gardner, Cannock, Stafford.
,, 8 (Eastern Counties) . . .	W. Saunders, Esq., Bank Chambers, London Road, Derby.
,, 9 (Shropshire)	Major J. Selby Gardner, Cannock, Stafford.
,, 10 (Birmingham and District)	do.
,, 11 (Northants to Essex) . .	W. Saunders, Esq., Bank Chambers, London Road, Derby.
,, 12 (South Wales)	Finlay A. Gibson, Esq., Park Place, Cardiff.
,, 13 (South-Western Counties)	J. G. Dennehy, Esq., Albion Chambers, Bristol.
,, 14 (South-Eastern Counties and London) . . .	W. Saunders, Esq., Bank Chambers, London Road, Derby.
,, 15 (Notts. and Derby) . .	do.
,, 16 (Leicester)	do.
Scotland:	
,, 17 (South-Eastern Counties)	R. Baird, Esq., 105, St. Vincent Street, Glasgow.
,, 18 (North-Western Counties)	
,, 19 (North-Eastern Counties)	
,, 20 (South-Western Counties)	

THE PLACES NAMED BELOW ARE JUST WITHIN THE BORDERS OF THE RESPECTIVE AREAS.

Area (1). *Northumberland.*—Berwick, Velvet Hall, Norham, Twizell, Coldstream, Sunilaws, Deadwater, Kershopefoot, Langholm, Longtown, Lyneside, Scotby, Weatherall, Heads Nook, How Mill, Brampton Town, Brampton Junction, Naworth, Low Row, Gilsland, Greenhead, Haltwhistle, Bardon Mill, Haydon Bridge, Fourstones, Hexham, Corbridge, Riding Mill, Stocksfield, Prudhoe, North Wylam, Wylam, Heddon-on-the-Wall, Ryton, Newburn, Lemington, Scotswood, Elswick, Newcastle Central, Manors, St. Peters, Heaton, Walker, Walker Gate, Wallsend, Howdon-on-Tyne, Percy Main, North Shields, Tynemouth.

Area (2). *Cumberland.*—Bowness, Port Carlisle, Gretna Floriston, Rockcliffe, Harker, Carlisle, Wreay, Southwaite, Calthwaite, Plumpton, Penrith, Eamont Bridge Junction, Clifton and Lowther, Shap, Tebay, Low Gill, Sedbergh, Middleton, Barbon, Kirkby Lonsdale, Ingleton, Melling, Hest Bank.

Area (3). *Durham.*—South Shields, High Shields, Tyne Dock, Jarrow, Hebburn, Pelaw, Felling, Gateshead, Bensham, Redheugh, Swalwell, Derwenthaugh, Blaydon, Elrington, Featherstone Park, Cumwhinton, Cotehill, Armathwaite, Lazonby, Little Salkeld, Langwathby, Culgaith, Cliburn, Temple Sowerby, Kirkby Thore, Appleby, Ormside, Crosby Garrett, Gaisgill, Ravestone Dale, Kirkby Stephen, Hawes Junction, Dent, Ribblehead, Leyburn, Sinderby, Otterington, Levesham, Scalby.

Area (4). *Lancashire.*—Morecambe, Bare Lane, Lancaster, Halton, Caton, Hornby, Wennington, Low Bentham, Bentham, Clapham, Horton, Settle, Long Preston, Hellifield, Bell Busk, Gargrave, Skipton, Elslack, Thornton, Earby, Foulridge, Colne, Nelson, Brierfield, Burnley, Townley, Holme, Portsmouth, Cornholme, Stansfield Hall, Todmorden, Walsden, Littleborough, Smithy Bridge, Milnrow, New Hey, Shaw and Crompton, Delph, Diggle, Saddleworth, Upper Mill, Greenfield, Friezland, Mossley, Micklehurst, Staley and Millbrook, Stalybridge, Godley, Woodley, Bredbury, Marple, Strines, Hayfield, New Mills, Bugsworth, Chinley, Furness Vale, Disley, Poynton (G.C. & N.S. Jt. and L. & N.W.), Wilmslow, Mobberley, Preston Brook, Sutton Weaver, Halton, Runcorn, thence by the Mersey to the sea.

Area (5). *Yorkshire.*—Scarborough, Forge Valley, Wykeham, Sawdon, Snainton, Ebberton, Thornton Dale, Pickering, Sinnington, Kirby Moorside, Norton, Helmsley, Thirsk, Topcliffe, Baldersby, Melmerby, Tanfield, Masham, Lofthouse-in-Nidderdale, Grassington, Rylstone, Crookrise, Embsay, Bolton Abbey, Cononby, Kildwick, Steeton, Keighley, Eastwood (L. & Y.), Marsden (L. & N.W.), Mottram and Broadbottom (Gt. Cent.), Dore and Totley (Mid.), Killamarsh (Mid.), Upperthorpe and Killamarsh (G.C.), Kiveton Park (Gt. Cent.), Barnby Moor and Sutton (G.N.), Beckingham (G.N. & G.E. Jt.), Blyton (Gt. Cent.), Market Rasen (Gt. Cent.), Louth (G.N.), Saltfleetby (G.N.), Theddlethorpe (G.N.).

Area 6. *North Wales.*—South of the River Mersey to Saltport (inclusive), Frodsham, Mouldsworth, Tattenhall Road, Malpas, Fenns Bank, Bettisfield, Old Woods, Leaton, Hanwood Road, Crockton, Ford and Crossgates, Criggion, Pool Quay, Seven Stars, Caersws, Pontdolgoch, Carno, Talerddig, Llanbrynmair, Cemmes Road, Machynlleth, Dovey Junction, Aberdovey.

Area 7. *North Staffs.*—Weaver Junction, Knutsford, Alderley Edge, Adlington, Bollington, Hartington, Alsop-en-le-dale, Tissington, Fenny Bentley, Thorpe, Cloud, Ashbourne, Clifton, Norbury, Rocester, Uttoxeter, Bromshall, Grindley, Chartley, Weston and Ingestre, Ingestre for Weston, Salt, Great Bridgeford, Tern Hill, Prees, Whitchurch, Wrenbury, Beeston Castle, Delamere.

Area (8). *Eastern Counties.*—Mablethorpe, Legbourne Road, Hallington, Withcall, Donington-on-Bain, South Willingham and Hainton, Wickenby, Gainsborough, Sturton, Clarborough Junction, Retford, Checker House, Edwinstowe, Farnsfield, Burton Joyce, Radcliffe-on-Trent, Long Clawson and Hose, Scalford, Melton Mowbray, Oakham, Manton, Uppingham, Seaton, Morcott, Luffenham, Ketton, Stamford, Uffington, Barnack, Helpston, Walton, Peterborough, Whittlesea, Benwick, Whitemoor, March, Stonea, Manea, Black Bank, Chettisham, Ely, Soham, Fordham, Kennet, Higham, Saxham and Risby, Bury St. Edmunds, Thurston, Elmswell, Houghley, Stowmarket, Needham, Claydon, Bramford, Ipswich, Westerfield, Derby Road, Orwell, Trimley, Felixstowe.

Area (9). *Shropshire.*—Wem, Yorton, Hadnall, Shrewsbury, Meole Brace, Redhill, Hanwood, Yockleton, Westbury, Middletown, Buttington, Welshpool, Forden, Montgomery, Abermule, Newtown, Scafell, Bucknell, Woofferton, Easton Court, Tenbury Wells, Newnham Bridge, Bewdley (G.W.), Codsall (G.W.), Haughton (L. & N.W.), Hodnet (G.W.).

Area (10). *Birmingham and District*—Stafford, Stafford Common, Hixon, Armitage, Lichfield, Tamworth, Polesworth, Atherstone, Nuneaton, Chilvers Coton, Bedworth, Hawkesbury Lane, Wyken Colliery, Longford and Exhall, Foleshill, Bell Green, Gosford Green, Coventry, Coundon Road, Kenilworth, Warwick (Milverton), Leamington, Southam Road and Harbury, Fenny Compton, Cropredy, Banbury, Kings Sutton, Adderbury, Aynho, Aynho Park, Fritwell and Somerton, Heyford, Bletchington, Blenheim and Woodstock, Kidlington, Yarnton, Oxford Road, Wolvercot, Oxford, Handborough, Charlbury, Ascott-under-Wychwood, Shipton, Kingham, Adlestrop, Moreton-in-Marsh, Blockley, Campden, Honeybourne, Littleton and Badsey, Evesham, Fladbury, Pershore, Stoulton, Abbots Wood Junction, Norton Junction, Spetchley, Fernhill Heath, Droitwich, Hartlebury, Stourport, Kidderminster, Churchill, Hagley, Stourbridge, Brettell Lane, Brierley Hill, Round Oak, Harts Hill, Netherton, Dudley, Dudley Port, Tipton, Princes End, Deepfields, Daisybank, Bilston, Ettingshall Road, Priestfield, Monmore Green, Wolverhampton, Dunstall Park, Bushbury, Four Ashes, Gailey, Penkridge.

Area (11). *Northants and Essex.*—Edwalton, Plumtree, Widmerpool, Upper Broughton, Old Dalby, Grimstone, Holwell, Ashfordby, Great Dalby, John-o'-Gaunt, Marefield Junction, Tilton, East Norton, Rockingham, Gretton, Harringworth, Wakerley and Barrowden, Ufford Bridge, Orton Waterville, Fletton, Wimblington, Stretham, Burwell, Newmarket, Welnetham, Bentley, Harwich, Parkeston Quay, Dovercourt Bay, Brightlingsea, Tollesbury Pier, Langford, Hatfield Peverel, Broxbourne and Hoddesdon, Hertingfordbury, Cole Green, Welwyn, Ayot, Wheathampstead, Harpenden, Redbourne, Hemel Hempstead, Berkhamsted, Wendover, Little Kimble, Haddenham, Ashendon Junction, Islip, Bicester, Ardley, Farthinghoe, Chalcombe Road, Eydon Road, Byfield, Southam and Long Itchington, Marton Junction, Brandon and Wolston, Shilton, Bulkington, Ullesthorpe and Lutterworth, Broughton Astley, Countesthorpe, Great Glen, Thurnby and Scraptoft, Rearsby, East Leake, Gotham, Ruddington.

Area (12). *South Wales and Mon.* Ynyslas, Glandyfi, Trewythan, Moat Lane Junction, Knucklas, Knighton, Kingsland, Greenhill, Tram Inn, St. Devereux, Dingestow, Raglan, Llandenny, Portskewett, thence by River Severn to the sea.

Area (13). *South-Western Counties.*—Chepstow, Tidenham, Tintern, St. Briavels, Redbrook, Monmouth, Symonds Yat, Lydbrook, Kerne Bridge, Ross, Fawley, Ballingham, Holm Lacy, Hereford, Moreton-on-Lugg, Dinmore, Ford Bridge, Leominster, Berrington and Eye, Worcester Shrub Hill, Wadborough, Defford, Bengeworth, Bretforton and Weston-sub-Edge, Stow-on-the-Wold, Eynsham, Kennington Junction, Radley, Culham, Didcot, Upton and Blewbury, Churn, Compton, Hampstead Norris, Hermitage, Newbury, Woodhay, Highclere, Burghclere, Litchfield, Whitchurch, Sutton Scotney, Kingsworthy, Winchester, Shawford and Twyford, Eastleigh, Bishopstoke, Swaythling, Southampton, Bitterne, Woolston, Sholing, Lymington.

Area (14). *South-Eastern Counties and London.* — Isle of Wight, Netley, Botley, Bishops Waltham, Itchen Abbas, Micheldever, Overton, Thatcham, Goring and Streatley, Cholsey and Moulsford, Littlemore, Wheatley, Tiddington, Thame, Bledlow, Princes Risboro', Great Missenden, Chesham, Boxmoor, St. Albans, Smallford, Hatfield, Cuffley and Goffs Oak, Cheshunt, North Weald, Blake Hall, Ongar, Chelmsford, West Maldon, Maldon East and Heybridge.

Area (15). *Notts and Derby.* — Whaleybridge, Chapel-en-le-Frith, Edale, Hope, Bamford, Hathersage, Grindleford, Dronfield, Eckington and Renishaw, Spink Hill, Shireoaks, Worksop, Clipstone, Mansfield, Bledworth and Rainworth, Gedling, Carlton and Netherfield, Netherfield, Nottingham, Beeston, Attenborough, Trent, Castle Donington, Weston-on-Trent, Chellaston, Repton and Willington, Egginton, Rolleston-on-Dove, Tutbury, Sudbury, Marchington, Longcliffe, Friden, Parsley Hay, Hurdlow, Hindlow, Harpur Hill, Ladmanlow, Buxton, Dove Holes.

Area (16). *Leicestershire.*—Burton, Stretton and Clay Mills, Melbourne, Kegworth, Hathern, Loughborough, Barrow-on-Soar, Sileby, Syston, Leicester, Humberstone, Humberstone Road, Wigston, South Wigston, Whetstone, Narborough, Croft, Elmesthorpe, Hinckley, Higham-on-the-Hill, Elford, Croxall, Wichnor, Alrewas.

Area (17). *Scotland, South-Eastern Counties.*—Burnmouth, Ayton, Carham, Sprouston, Kelso, Roxburgh, Kirkbank, Nisbet, Jedfoot, Jedburgh, Saughtree, Steele Road, Newcastleton, Kirkpatrick, Kirtlebridge, Ecclefechan, Lockerbie, Netherclough, Dinwoodie, Wamphray, Beattock, Moffat, Elvanfoot, Crawfordjohn, Thankerton, Bankhead, Tarbrax, South Cobbinshaw, Breich, Woodmuir, Bents, Whitburn, Polkemmet, Weighs, Bathgate, Bangour, Linlithgow, Philpstoun, Dalmeny, South Queensferry, Barnton for Cramond Brig, Granton, Leith.

Area (18). *Scotland, North-Western Counties.*—Wemyss Bay, Bridge of Weir, Houston (G. & S.W.), North Johnstone, Elderslie, Paisley West, Gleniffer Depot, Barrhead, Netherton, Patterton, Whitecraigs, Busby, Thorntonhall, Hairmyres, East Kilbride, Strathaven, Coalburn, Inches, Douglas West, Poneil Jct, Douglas, Ponfeigh, Sandilands,

Lanark, Cleghorn, Carstairs, Carnwath, Auchengray, Haywood, Mouldron, Fauldhouse and Crofthead, Armadale, Armadale Colliery, Westfield, Bowhouse, Causewayend, Lochmill, Manuel, Kinnie, Bo'ness, Bridgeness, Grangemouth, Dalders, Falkirk, Larbert, Airth, South Alloa, Throsk, Plean, Bannockburn, Gargunnock, Doune, Comrie, thence to a point south of Inverness (exclusive) to Kyle of Lochalsh (exclusive).

Area (19). *Scotland, North-Eastern Area.*—Burntisland, Aberdour, Inverkeithing, North Queensferry, Charlestown, Cairneyhill, Torryburn, Culross, Kincardine, Alloa, Cambus, Stirling, Bridge of Allan, Dunblane, Kinbuck, Crieff, Dalnaspidal, Dalwhinnie, Newtonmore, Tomstin, Mey, Daviet, Inverness, Bunchrew, Lentran, Clunes, and all stations on the Highland Railway north of a line drawn from Beauly to Kyle of Lochalsh (inclusive).

Area (20). *Scotland, South-Western Area.*—Largs, Kilbarchan, Johnstone, Neilston, Ryeland, Glenbuck, Leadhills, Wanlockhead, Lochmaben, Annan, Dornock, Rigg, Gretna Green.

[Continued from p. 63.]

areas, and an area producing more coal than it requires for consumption within the area itself should only distribute the balance to adjacent or convenient areas.

The three columns in the table, p. 63, form an interesting study in this latter connection.

A Conservative Estimated Saving.

Statistics which have been taken out, after providing for the additional demands upon coal for industrial purposes that are continually being made—for instance, the starting-up of new blast-furnaces in different parts of the country is going on at a very rapid rate—show that 42,000,000 tons of coal will be dealt with under this initial scheme; and it is regarded as highly conceivable that the estimated saving of 700 million ton-miles will prove to be a conservative one, because in this is not taken into account the saving of the distance which empty wagons now have to be hauled back to the collieries, nor any economy that will be made in marshalling and shunting all these wagons.

Special Fuel for Special Purposes.

Having laid down the four general principles set out above, it has been found essential, as regards No. 4, to make some reservation in the interests of the need for the provision of fuel of a special type for a special purpose. Arrangements are therefore being made for the issue of certificates authorizing supplies of coal of a special type required by steam raisers for special purposes—*e.g.*, mechanical stokers, gas-producers, &c. In the absence of such certificates, collieries, factors, and merchants will be unable to supply the special quality.

Coal and Coke Supplies Committees—An Independent Committee.

Before the advent of the Coal Controller, the Board of Trade had appointed District Coal and Coke Supplies Committees—and many have been the complaints regarding their decisions. It was the duty of these Committees to see that the Government factories and public utility companies and, to a certain extent, domestic users had their requirements met. Whatever may be the opinions of some of those who have had in the past to abide by decisions of these Committees, it must be placed on record also that, in the Coal Controller's office, the opinion is emphatically held that they have done excellent work. Indeed, these Committees have been empowered by the Controller to conduct the necessary arrangements for putting the new scheme into force; the only modification being that an additional member has been added in each district, who is entirely unconnected with the coal trade. A man of public importance in each district has been selected for this purpose, with the object of seeing that the Committees work on fair principles in every respect. This must by no means be construed into a suggestion that hitherto these Committees have not worked fairly and well; but, with such a big scheme as the new one, it was felt by the Coal Controller that there should be somebody on the Committees who had no interest in coal.

By proceeding on these lines, it is considered that a minimum of inconvenience will be caused to all concerned, as collieries in each area will thus be placed in direct touch with the factors, merchants, and direct consumers whose supplies they will have to provide in future. There will consequently be no necessity for those whose supplies are affected under the scheme to proceed in search, on the one hand, of new customers or, on the other, of new collieries. As a safeguard, however, should any factor, merchant, or direct coal consumer not hear from a colliery by Aug. 27, that it is authorized to send supplies, a communication should be made to the District Coal and Coke Supplies Committee stating full particulars, in order that inquiries may be conducted and arrangements made for a supply before the scheme comes into operation throughout Great Britain on Sept. 10. In developing the scheme generally, there has been a free interchange of views with the District Committees as representing the colliery owners; and there have been meetings with factors and merchants. The Coal Controller is also in touch with the Railway Executive Committee, with a view to ensuring that adequate arrangements are set-up to meet the changed conditions in the flow of traffic.

One point may be emphasized, and it is that the scheme does not affect water-borne coal, either export, coastwise, or bunkers, or anthracite, or coke of any description.

Contracts Cancelled on Sept. 8.

In the case of coal affected by the scheme, existing contracts will be cancelled at 6 p.m. on Sept. 8; and new contracts, to be arranged between now and that date, will come into operation, as already mentioned, on Monday, Sept. 10.

Maps and Details.

One important point is that maps and a diagram* have been prepared which, in conjunction with the explanatory memorandum which has been issued by the Coal Controller, and may be obtained from his department, will enable coal consumers to see from what areas they can get their supplies. Upon this, the schedule already given throws considerable light.

All this, of course, takes into prime consideration the use of coal for industrial purposes. So far as the domestic supplies of London are concerned (London being probably furthest removed of any large centre from the coalfields), there are still difficulties; although having regard to the conditions at sea it is pleasing to know, as we do, that the amount which comes now by water from the North to London runs into millions of tons per annum.

A Good Augury and Possibilities.

A good augury that the scheme will be accepted loyally by those in whose interests it has been designed is the manner in which, as the result of interviews between the Coal Controller and various important sections of industry depending upon coal, assurances have been given that they would be able to carry out their obligations even if they had to put up with an inferior class of coal. Looked at from this point of view, it may perhaps be that an inferior coal is, after all, better than no coal at all; and left without real control, it is not impossible that this position in many instances might have been reached next winter.

Many possibilities, of course, arise out of the scheme, and, as far as humanly possible, the Controller's department is doing its best to anticipate at any rate the most important. There is no intention, for instance, to allow seaborne coal at present under contract to be transferred to rail. Then we are able to say that, although the Local Government Board might be unwilling to relax the London regulations as to smoke emission, the fact that inferior coals will have to be used under the scheme, and probably more smoke emitted, will be borne sympathetically in mind.

The possibility of a combine among the coal owners in the scheduled areas, bearing in mind that competition from outside will practically be eliminated, has been put forward; but any such attempt is likely to receive sharp treatment.

Insistence on the Price Limitation Act being Observed.

The Coal Controller, when addressing both the Institution of Gas Engineers and the Incorporated Municipal Electrical Association, expressed his determination to enforce the terms of the Coal Price (Limitation) Act; and, although there is no disguising the fact that this Statute has not been particularly successful in protecting the consumer—the purpose with which it was designed—yet it is capable of enforcement. That this is the view of the Coal Controller's Department is manifest from the decision not to leave the matter in the hands of the District Committees. It is, in fact, to be dealt with from headquarters, and, from assurances that we have, in no uncertain manner.

BOARD OF TRADE ORDER.

The Board of Trade Order under which the scheme is to be carried into effect was issued in the "London Gazette" on Friday. It is as follows:

(1) With a view to effecting economies in transport and of facilitating the supply of coal, such restrictions may be placed on the transport of coal from particular areas or particular collieries in the United Kingdom to particular areas or particular destinations as the Board of Trade may from time to time consider necessary; and, when such restrictions are so placed, it shall be the duty of every person affected thereby to comply with the requirements of the Board of Trade for the purposes of giving effect thereto.

(2) Contracts for the sale of coal shall be abrogated to such extent and as from such dates as may be deemed by the Board of Trade to be necessary in order to secure compliance with their requirements under this Order.

(3) The requirements of the Board of Trade under this Order shall be notified in the form of directions issued from time to time by the Controller of Coal Mines. Such directions may relate to any or all of the following matters: (*a*) The restriction or discontinuance of the transport of coal from particular areas or particular destinations, either absolutely or by any specified method of transport or otherwise than by such method of transport as may be specified. (*b*) The contracts which are to be regarded as abrogated with a view to facilitating compliance with such directions. (*c*) Furnishing information by and to such parties and in such forms as may be specified in the directions. (*d*) Any other matters for which provision may be necessary for the purpose of this Order.

(4) Infringements of this Order are summary offences, subject to penalties under the Defence of the Realm Regulations.

(5) This Order may be cited as the Coal Transport Order, 1917.

* Copies of these maps, also of the diagram illustrating the effect of the scheme on the area interchanges, have been prepared by the Railway Clearing House, and may be obtained, with a pamphlet embodying full instructions, by all concerned, post free, on application to the Secretary, Railway Clearing House, 123, Seymour Street, London, N.W. 1.

THE COMPLETE GASIFICATION OF COAL.

By Dr. ALEX. NAUMANN, Professor of Chemistry at the University of Giessen.

A brief abstract, taken from the "Journal of the Society of Chemical Industry," was given in the "JOURNAL" for June 12 of an article in the "Chemiker Zeitung" for Jan. 3 last, by Dr. Alex. Naumann, where he described a scheme for the complete gasification of coal to which a good deal of prominence has lately been given in Germany. The following is a fuller summary of Prof. Naumann's contribution—translated from the original.

INTRODUCTORY.

The problem of how coal can be gasified without leaving any residue except incombustible ash or clinker has been solved recently. The solution is by means of a simple plant, complete in itself, with internal gas heating, which effects considerable economy of energy and affords great latitude in the bye-products and description of gas produced, and a large yield of ammonia, while it may be applied to any carbonaceous fuel as well as coal. The process in question has been worked out by the Dellwik-Fleischer Water Gas Company, of Frankfort on the Maine, through Herr E. Dolensky, the Manager of the Company. Incidentally, the Company had previously effected the complete gasification of coal by converting coke resulting from the carbonization of coal into water gas in plant of which the units were constantly increasing in capacity or output. Their more recent development of the complete gasification of any kind of coal has been described in a monograph of 95 pages by E. Dolensky, entitled "The Complete Conversion of Coal into High-Grade Gas and Valuable Liquid Products by Simultaneous Gasification and Volatilization."

THE PROCESS.

The plant or producer ought to utilize the coal completely, except for its ash, in producing a high-grade gas as nearly as possible consisting only of combustible constituents, while affording a maximum yield of high-class oils and converting as much as possible of the nitrogen into ammonia. The producer or carbonizer adopted to achieve these objects consists of a tall vertical vessel or retort, heated internally by gas. The coal passes slowly downwards through this producer, while the heating gases pass upwards; the temperature increasing gradually from the top to the bottom. Water, ammonia, readily volatile oils, and high-grade gas are first given up by the coal, which later yields viscous tar, methane, and its homologues, and finally, along with hydrogen (which has already been evolved to some extent), carbonic oxide. The completely carbonized coal passes on as coke to the generator, which is directly underneath the carbonizing chamber with no dividing wall or partition. In this lower part of the plant the coke reacts with steam to produce water gas, which serves to drive off the volatile constituents of the coal in the upper part. The supply of heat needed for the generation and carbonization is provided by periodical "blows" of the coke; the products of combustion resulting from the "blows" being discharged into the outer air. The air blast for the "blows" enters at the zone between the upper and lower parts of the plant, and travels downwards through the coke in the lower part, where the pressure is reduced. Simultaneously a hot blow across the lower part of the generator, in which the bottom of the column of coke is poor in carbon and rich in ash, is maintained by a reversible air-blast passing over a fire bridge.

After "blowing" for one to three minutes, steam is passed up through the column of coke for from five to ten minutes. The water gas produced, along with the undecomposed steam, rises in its highly heated state through the column of carbonizing coal, and by its sensible heat promotes rapid carbonization of the coal and evolution of its volatile constituents. Finally the mixed gases pass through the unaltered coal, and their sensible heat distils products from it. They then pass on to the hydraulic main, thence to condensers, washers, and purifiers, and so to a holder. Provision is made, if necessary, to burn a small proportion of the water gas by introducing air at the dividing zone between the coal carbonizer and the water-gas generator, in order to increase the temperature to the required degree if the coal carbonization does not take place satisfactorily without such aid. The resultant gas is thereby slightly diluted with the products of combustion of the water gas. If, on the other hand, a particular coal needs a lower temperature for its carbonization, or greater humidity is desired in order to increase the yield of ammonia, steam may be introduced at the dividing zone to supplement the excess of steam supplied for water-gas generation.

These arrangements admit of the most favourable conditions of temperature and humidity being provided for dealing with any particular coal, and for obtaining the best yields of gas, oil, and ammonia. The process is known as the triple or tri-gas process. It is claimed that it will handle any kind of coal, giving complete conversion into gas, tar, and ammonia, and leaving only fully exhausted clinker or ash as a residue. The gas-making plant proper needs the ordinary auxiliary equipment of coal-handling plant (bunkers, elevators, conveyors, &c.) by which the coal is brought to the charging-hoppers. The working of the plant is controlled from the top stage.

The experimental plant had a capacity of 100 to 200 tons of coal per hour, and has been on trial for over a year. Every trial has extended continuously over several days—the last trial, in May, 1916, lasted for 21 days. Samples of the coal used and of all the products were taken; the gas was measured, analyzed, and its calorific power determined. After the first trial in June, 1915, a reconstruction of the generator was carried out, with the result that a perfectly satisfactory construction was obtained. It is possible to modify the working to produce at will more high-grade gas, or more oil, or more ammonia. Both coal and brown coal (lignite) have been gasified quite satisfactorily in their natural moist condition—even Bosnian brown coal permeated by 30 p.ct. of rock has been dealt with readily. The residue is either fully burnt ash or a soft clinker mixed with lumps. The gas made varies, according to working conditions, from 210 to 370 B.Th.U. per cubic foot—even from brown coal a gas of 315 B.Th.U. was obtainable. Readily volatile oils were produced, and the yield of ammonia approached the theoretical maximum, when favoured by humidity, rapid extraction, and low temperature. The gas left the generator at a temperature of only about 100° C.

QUALITY OF "TRI-GAS."

The composition of the gas varies, according to the description of coal treated and the mode of working, between the following limits:

	Good Coal, Per Cent.		Wet Lignite, Per Cent.
Hydrogen	50·0	..	41·0
Methane	10·0	..	5·6
Carbon monoxide	30·0	..	26·0
Heavy hydrocarbons	1·0	..	0·4
Carbon dioxide	5·0	..	9·0
Nitrogen	4·0	..	18·0

The calorific power, according to the description of fuel—lignite, brown coal, or bituminous coal—and the working conditions, ranges from 260 to 370 B.Th.U. per cubic foot. The gas is merely a mixture of water gas and coal gas, with, in a few cases, small quantities of producer gas. Hence it has been named "Tri-gas." Water gas is its predominant constituent, as must be evident from the fact that coal on carbonization yields 70 p.ct. of coke. The properties of "Tri-gas" are essentially those of water gas. It is less dense than producer gas, which is an advantage from the distribution standpoint. It has a higher temperature of combustion (flame temperature) than coal gas, and consequently affords a better utilization of its heating value in all processes requiring a high temperature, such as smelting, welding, and many chemical processes. Thus it is claimed to be a high-grade heating gas.

ECONOMY OF THE PROCESS.

The calculations of cost, based on the results of the trials in the experimental plant, show, according to Dr. Naumann, that the process is highly economical. [The calculations are not given in the paper.] With a good brown coal, the receipts for tar and sulphate of ammonia cover all expenses, leaving the receipts for the gas produced as net profit. With bituminous coal, after deducting the receipts for tar and sulphate of ammonia, the cost of the gas works out at about 2·04d. per 1000 c.ft. Having regard to the high-grade of the gas as an industrial fuel, its transmission to considerable distances by comparatively small mains would pay well; and its distribution from a central works to factories, towns, and villages should leave a high profit. It presents the best means of overcoming the prejudice against the abolition of the use of coal as fuel, and hence of doing away with the wastefulness inseparable from the combustion of solid fuel.

STATE CONTROL.

It may be predicted that the simplicity and economy of the Tri-gas process will make it a powerful aid to large industrial concerns, companies, corporations, &c. This may not tend to the greatest economy and the highest benefit of the consumer, or, in other words, to the common weal. It is only necessary to refer to the cognate case of the spendthrift policy of the existing electricity combines, which comprise large numbers of electricity supply undertakings working in unison. Their operations are contrary both to public economy and to the consumers' interests. It should be the duty of the State to see that these adverse conditions are not extended to the far-reaching benefits which the provision of energy by the Tri-gas process will afford. The advantage of the community as a whole should be kept in the foreground, rather than the greater profit of individual undertakers and large companies, which have taken advantage of war conditions to strengthen themselves by combination, which will ultimately be to the detriment of the consumer. The only plan is for the State either to control the operations of such undertakings, or itself to produce and distribute their products.

In order to prevent the senseless waste of coal which has hitherto prevailed, State control is essential, not merely to secure the general introduction of complete coal gasification, but also to prevent the use throughout Germany of apparatus which is wasteful of energy. In this way, raw coal will be economized, and producers, distributing schemes, &c., of the highest duty will be provided. The State should say before it is too late not only what must be done, but how it must be done. The coal supplies of Prussia alone, if gasified in the manner indicated above, would suffice to supply the energy required by the whole of Germany for heating, lighting, and power. There would thus be provided

a great source of revenue for wiping-out the war debt, and excessive taxation of the citizen would thereby be avoided. State intervention is imperatively called for in order to ensure that every user obtains a supply of energy for heat, light, and power through cheaply made heating gas. A great part of the coal now so lavishly expended would then be saved for posterity. This "burning question" needs to be tackled by the State in the near future, and for their own protection and for the commonweal, the small consumers, the middle classes, tradespeople, &c., should see that their interests therein are well represented in the Reichstag or Parliament, where the interests of the big industrial undertakings are already strongly represented.

In a footnote, the author points out that Dr. E. R. Besemfelder has conceived a process, which he describes in an article published early in 1916, which resembles the Tri-gas process, which had then already been on practical trial. He proposes to pass hot water gas through the coal in a bench of vertical retorts, which would also be heated externally by the complete combustion, in flues surrounding them, of the "blow" gases from the water-gas generators. The coke from the vertical retorts would be discharged into the water-gas generators on a lower level. Besemfelder calculates that the recovered sulphur would not merely cover all the requirements of Germany for home consumption, but would leave a surplus for the export of sulphur and preparations made from it. The present vitiation of the atmosphere by the combustion of the sulphur of the coal would also be avoided.

LOW-TEMPERATURE CARBONIZING.

A paper was read last February before the Glasgow Section of the Society of Chemical Industry, by Mr. Robert Maclaurin, on "Low Temperature Carbonizing and Some Products." An abstract of the communication will be found in the "JOURNAL" for March 13 (p. 517); and Mr. Maclaurin's system was described and illustrated in the issue for Aug. 8 last year (p. 256). The full text of the Glasgow paper is, however, now available in the Society's "Journal;" and from it is reproduced the following portion referring to the production of gas. The plant on which the work was carried out is erected at Port Dundas. It has two compartments—one (A) for the production of smokeless fuel and illuminating gas, and the other (B) for the production of power gas, both with oil and ammonia as bye-products.

To ascertain how much hot gas would be required to carbonize satisfactorily one ton of coal, 13 tons of coal were treated, yielding an average of 13,725 c.ft. of gas per ton. All the coke coming out during the run, which was of 22 hours' duration, seemed satisfactorily carbonized. Assuming 5000 c.ft. of rich gas (of 700 to 800 B.Th.U.) to be given off from each ton of coal in compartment A, this meant a make of about 9000 c.ft. of producer gas in compartment B; and as this gas presumably had a value of about 130 B.Th.U., the calorific value of the mixed gas should have been 351 B.Th.U. The average value found by calorimeter was 180 B.Th.U., and by gas analysis on one sample 206 B.Th.U. The small quantity of hot gas necessary to carbonize the fuel was very gratifying; but the low calorific value was both disappointing and inexplicable. According to published figures by the late Prof. V. B. Lewes, with distillation at 400° C. a ton of coal would yield the products shown in Column 1. Column 2 shows what were obtained at Port Dundas. Column 3 shows gas-works results with high-temperature carbonization.

—	Carbonizing at 400° C.	Port Dundas Method.	Gas-Works Practice.
	C.Ft.	C.Ft.	C.Ft.
C_nH_{2n}, &c. . . .	315	53	317
CH_4, &c. . . .	3000	1420	3755
H_2	1060	1685	4627
$CO+CO_2$ . . .	620	2973	1200
N_2	50	6294	100

In this trial therefore one-sixth of the olefines was obtained by low-temperature and high-temperature distillation, and less than half the volume of methane. Unfortunately at this stage accurate measurements of the oil were impossible, owing to the difficulty of separating oil from water; but the percentage of light oil was ascertainable. The following are the figures, supplied to the author by the Gas Department, for the portion of the oil condensing in the first scrubber: Sp. gr. of water-free oil, 1·037. Distilling at 170° C. =0·34 p.ct., sp. gr. ·968; 170° to 270° C.=21·26 p.ct., sp. gr. ·970; 270° to 425° C.=15·41 p.ct., sp. gr. ·0995; residue (solid), 62·30 p.ct., sp. gr. 1·085; loss, 0·69 p.ct.

The crude naphtha from low-temperature tars is given by Lewis T. Wright as equal to 9 p.ct. on the tar, or 9 lbs. per ton of coal. With a high temperature it falls to 3·45 p.ct. or about 3½ lbs. per ton. In the Port Dundas results it falls to about ½ lb. per ton of coal.

In a second test run the gas was no better. The quantity of oil obtained, however, amounted to about 16 gallons per ton of dry coal. This time the distillate up to 170° C. gave 2·6 p.ct. of naphtha, of sp. gr. ·965.

A third test was made in March of last year, using water gas made by decomposing steam in compartment B, for effecting the carbonization of the fuel. Naturally, this gave a better gas, owing to the comparative freedom from nitrogen; but the percentage of olefines varied from 0·2 to 1·1 p.ct., and the methane from 7 to 13 p.ct. The gas was, therefore, in this respect little better than formerly.

To ascertain whether light oils, if produced, could pass the scrubbers, gasoline of sp. gr. ·650 was added both before and after the first scrubber at the rate of ½ gallon per 1000 c.ft. The improvement in the gas at the gasholder was not apparent, and analyses showed the olefines and the methane to be practically unchanged. In the first test the olefines amounted to 0·2 p.ct., in the second to 1·1 p.ct.—practically the same as for the preceding two tests when no gasoline was used. The completeness with which the scrubbers were removing the gasoline might have misled; but fortunately the next test saved an erroneous impression. The scrubbers are centrifugal brush scrubbers, designed for cheapness. Each scrubber is 10 ft. × 4 ft. In order to keep conditions as uniform as possible, during the additions of the gasoline, the fuel was not disturbed in either A or B compartment; but as soon as the tests were over, ash was removed in compartment B, and an immediate improvement in the composition of the gas followed. The olefines rose to 1·4 p.ct., the methane to 15·7 p.ct., and the calorific value to 377 B.Th.U. This improvement in the gas followed the bringing down of new fuel in compartment B, and the rise in the olefines was undoubtedly due to the hydrocarbons driven off from this fuel being partly decomposed, as they passed up through the hot fuel in compartment A, into ethylene and other light hydrocarbons. The scrubber allowed these light gaseous hydrocarbons to pass, while it prevented the passing of the heavier hydrocarbons of the gasoline.

These results, together with later results and numerous unrecorded results, convinced the author that it was hopeless to look for rich gas by a true low-temperature method, though he firmly believed that illuminating gas would yet be made in a plant such as had been described. This, however, will be done by a semi-high temperature method.

On the completion of the third trial, in an endeavour to account for the absence of the light hydrocarbons, the oils were examined more thoroughly. The oil was so hopelessly mixed up with the ammoniacal liquor that it seemed quite impossible to get it into a marketable state. Even a sample, which to all appearance was water-free, showed about 20 p.ct. of water on distillation.

Synthetic Gasoline in the United States.

In a recent issue, "Engineering" published the following paragraph: We have repeatedly referred to the gasoline cracking process of Dr. W. F. Rittman, and have heard critical comments on the process and doubts as to its efficiency. In a paper, read in April before the Kansas City meeting of the American Chemical Society, entitled "One Billion Gallons of Synthetic Gasoline in the year 1918," Rittman mentioned that 600 million gallons of gasoline would be prepared in the United States in 1917, and the production would reach 1000 millions in 1918. This was necessary to meet the ever-increasing demand. The gasoline recovery from natural gas had increased from 7 million gallons in 1911 to 200 millions in 1917; the crude oil production from 135 million gallons in 1905 to 292 millions in 1916; and the gasoline production from 7 million gallons in 1904 to 70 millions in 1917 [we give round numbers]. The extensive demand had been met by taking a larger portion of motor fuel from the crude oil and calling it gasoline, and by cracking heavy oils for gasoline; but it is indeed a question of general economy how much further the supply of petroleum should be placed at the disposal of the synthetic gasoline manufacturer.

Midland Junior Gas Association.—The tenth annual general meeting of the Association will be held in the Council House Reading Room, on Thursday, to receive the report for the three sessions 1914-17 and the balance-sheet, as well as to transact other formal business. Afterwards there will be a debate on the question of whether gas for lighting purposes will be superseded in the future by electricity. The Association have 38 members absent on war service.

A Large Gas-Fired Annealing Furnace.—Details are given in the "Iron and Coal Trades Review" of a large Stein and Atkinson gas-fired furnace installed for annealing large forgings at the works of Messrs. W. Somers & Co., Ltd., of Halesowen. The furnace, which has replaced coal fuel, was not put down particularly with a view to higher economy in working costs; the prime consideration being better and more uniform results. In practice it has thoroughly justified itself, both in regard to efficiency and economy. The supply of gas is so arranged as to allow of the temperature throughout the whole length of the furnace being under complete control. Indeed, if pyrometers are employed, it is possible to maintain an even temperature throughout the full length (75 ft.) of the furnace. This overcomes the difficulty of uneven heating of irregular forgings; it being possible to adjust the amount of gas supplied to each section. Another feature is that the amount of air admitted to the furnace being under control, any required atmosphere can be obtained.

MASSACHUSETTS GAS COMPANIES AND THE RECOVERY OF LIGHT OILS.

A Committee of the Massachusetts Gas Companies recently sent a communication to the War Department offering the services of the companies to the Government in the matter of the recovery of bye-products for making explosives. The communication was acknowledged with thanks; but nothing further has developed. The Committee have since had a conference with representatives of the manufacturers of recovery plant; and as a result they have come to the following conclusions:

(1) The Government is well supplied for its present needs by the existing coke-oven plants; and some of the larger companies of the country.

(2) The installation and development of the operation of the necessary apparatus in two or three of the larger companies of the country, which is now going on, will supply five times as much material as all the companies in New England, outside Boston.

(3) The manufacturers are not, at the present time, in a position to take orders for any more apparatus than they are now building for the larger companies; and the Government controls so much of the steel production that very little apparatus could be bought, except through orders from the Government.

(4) The question of the fractionation and purification of the crude light oils will have to be left to future developments.

(5) Companies should not attempt recovery under a candle-power standard.

(6) It was further brought out that the production of light oil in coke-oven plants alone in 1916 was 35,600,000 gallons, which yielded about 20,000,000 gallons of pure benzol and some 4,300,000 gallons pure toluol. There are in operation 7000 coke-ovens, at present carbonizing 31,000,000 tons of coal, and an additional number under construction of 2400, with a capacity of 15,000,000 tons of coal annually. If all these plants are completed and run at full capacity with a full recovery of light oil, there will be produced 101,500,000 gallons; and from this light oil would be obtained 60,000,000 gallons of pure benzol and 12,000,000 gallons of pure toluol. This does not include water-gas plants or coal gas produced from retorts; and it is estimated that two large companies will add 9,000,000 gallons of benzol and 4,000,000 gallons of toluol to these amounts, in the near future.

It therefore appears quite evident that the only work which your Committee can do at the present time is to compile data in regard to the amount of gas made in New England, and to render any other help to the Committee of the American Gas Institute, formed for the same purpose, who are working in conjunction with the Committee of Munitions of the Advisory Board of the National Council of Defence. These data have been given to the Committee.

Your Committee are also collecting further information, in order to be in a position not only to help the Committee of the American Gas Institute, but also to advise the Massachusetts companies, from time to time, as to the development of the work, and instruct them as to procedure, if it is found that our help is required.

Gas Made—1916.

	Cubic Feet.
Maine	576,601,360
New Hampshire	620,079,569
Vermont	245,324,800
Massachusetts (less Boston)	10,640,203,000
Rhode Island	2,523,075,490
Connecticut	4,709,966,665
	19,315,250,884
Boston	6,151,673,794
Total	25,466,924,678

VIEWS OF THE AMERICAN GAS INSTITUTE.

The following reference to the same matter, in which a somewhat different view is expressed of what is likely to be required of the gas industry, may be quoted from the June issue of the "American Gas Institute News."

"The Advisory Commission of the Council of National Defence is now in full swing organizing the industries of the country for war, and assisting the Council of National Defence. A Committee known as the Committee on Chemicals, a Sub-Committee of the Advisory Commission, has been appointed. A Sub-Committee of the Committee on Chemicals, known as the Committee on Coal Tar Bye-Products, has also been appointed. This Committee is one that touches the gas industry very closely. The names of W. R. Addicks, W. E. M'Kay, C. J. Ramsburg, and W. H. Gartley appear on it.

"The gas industry will doubtless be called upon to produce still larger quantities of benzol and toluol. It is logical to assume that the Government will soon find itself in the position in which the production of additional quantities of these materials for high explosives manufacture will be of the greatest urgency; and we know that the companies supplying gas to the various cities are the only resort now left for this production, except such as may be made by chemically treating natural gas. The gas companies of the larger cities not now engaged in recovering benzol and toluol from their gas may expect soon to be called upon for this work. How the expenditure is to be made and how the plants are to be installed, must be given serious consideration by the proper Federal officials. This is the next important step. When the questions of price to be paid for the toluol, and how the erection of the recovery plants are to be financed, are once satisfactorily settled, the work may be expected to go ahead with great rapidity; and millions of gallons of toluol and benzol can be produced. In those cities in which candle-power requirements are high, there must be a concession on the part of the Government and the Public Service Commissions having control, since high candle power and high heat units are not compatible with toluol and benzol extraction."

OBSERVATIONS ON CRUDE (COKE-OVEN) BENZOL.

At the Meeting of the London Section of the Society of Chemical Industry on Monday of last week, Dr. P. E. SPEILMANN gave an account of some recent work that has been carried out by him and Mr. G. CAMPBELL PETRIE. The object in view, when examining these distillates, was to extract more information from them than is obtainable from the retort test—a test which the authors think has little to recommend it, and has nothing to support it scientifically. With the idea of arriving at methods which will recommend themselves to the simplest works laboratory, no preliminary treatment was carried out; the samples being examined as received.

It has been found that if 100 c.ft. of crude benzol is distilled from a distilling flask such as is now so widely used in connection with Government tests and specifications, the amount obtained up to 90° C. can be made proportional to the quantity of benzene present, and that from 90° to 120° proportional to the quantity of toluene in the sample. A curve was shown giving the relation between the amount obtained by the distillation test and the percentage of toluene and benzene present in the sample by analysis. It was noticed that the distillation test results lay more regularly than the retort test results.

Another mode of examining crude benzols, yielding on the whole more accurate results, is to distil at least a litre over a Young 12 pear head, and to note the rise of temperature for every 5 or 10 p.ct. When such curves are plotted, it has been found that the horizontal distances below the 5 p.ct. mark and the point where the curve cuts the 92·5° C. line give a close measure of the percentage of benzene present; and a similar close estimation of the toluene present can also be made—the relationship being read off by means of a graph. It is believed that an equally simple estimation of paraffin can be arrived at, though the work done in this direction so far is quite insufficient for the establishment of a definite rule.

The fact that during the distillation of coal a low temperature favours the production of paraffin, and a high temperature that of aromatic hydrocarbons, appears, in the authors' opinion, to establish the connection between the various substances found according to the following scheme:

PENTANES AND HEXANES.

$$C_5H_{10} \longrightarrow C_2H_4 \longrightarrow$$
$$+ \qquad\qquad +$$
$$CH_4 \qquad\qquad C_3H_6$$

naphthenes (alicylic hydrocarbons) → higher benzene homologues → lower benzene homologues → benzene → (diphenyl) → naphthalene → anthracene → carbon and gas.

On this basis, therefore, it may be expected that the amount of loss on acid-washing would be inversely proportional to the quantity of aromatic substances present, and that the quantity of benzene and toluene found would be inversely proportional to one another. Very few of the crude benzols examined by the authors conformed to the general definition for crude benzols—viz., that they should distil over up to 170° C. Most of them contained a considerable proportion of naphthalene. For the purpose of the paper, therefore, the fraction up to 170° C. obtained in the laboratory is taken as representing a crude benzol as it should normally be produced. If the quantities of benzene, toluol, and xylene found in the fraction up to 170° C. be plotted against the loss on acid washing of this fraction, it is seen that the two main constituents do actually occur in their inverse connection with one another; and when these are added together and combined with the figure of zylene, the total aromatic substances in that fraction show a remarkably constant inverse relationship with the acid washing.

It might be a daring suggestion that the loss on acid washing may be taken as a measure of the three aromatic substances present in such a sample, yet the startling regularity of the plotted line, in the authors' opinion, almost compels its acceptation. From the figures, it appears that the phrase "loss on acid washing" should be precisely defined in meaning, as there is a considerable difference between the loss occurring after chemical treatment and the total treatment after including the subsequent distillation.

THE COLOUR TEMPERATURE OF ILLUMINATING GAS-FLAMES.

By E. F. KINGSBURY.

[A Note from the Physical Laboratory of the United Gas Improvement Company to the "Journal of the Franklin Institute."]

It is of considerable importance in the photometry of gas-flames to know their colour temperature, because it determines the efficiency at which incandescent electric lamps must run to match them in colour.

While the colour temperature of the ordinary illuminating gas-flames has been known approximately for a long time, recently the question of its variability with the quality of gas and the flame size arose. So the following data may be of interest. Each flame was matched against a carbon lamp whose efficiency was accurately known at several voltages. Using the data on colour temperature given by Hyde and Forsythe in the March "Institute Journal,"* these matching voltages have been evaluated in terms of temperatures:

Colour Temperatures of Various Gas-Flames.

Source.	Lamp Voltage (E.T.L. No. 4621).	Colour Temperature ° K.
1. Coal gas, full flame	111·0	2075
2. Coal gas, half turned down	107·5	2035
3. Water gas, full flame	115·4	2118
4. Water gas, half turned down	105·5	2015
5. Water gas, full flame, edge on	111·5	2080
6. Mixed gas, full flame	113·5	2095
7. Coal gas, full flame	113·8	2100
8. Coal gas, candle-shaped flame, height of Hefner (Reference points)	97·0	1940
9. Pentane lamp	93·5	1914
10. 4·85 W.P.M.S.C.P. carbon	110·4	2070
11. 3·73 W.P.M.S.C.P. carbon	118·8	2153
12. Hefner	88·0	1875

Nos. 1 to 6 inclusive were using an 8-ft. Von Schwarz excavated head lava tip; No. 7 was with an 8-ft. Bray union-jet tip, and No. 8 was with a ⅛-in. open tube; Nos. 9 to 12 were taken as references from the paper referred to. The coal gas was 8 to 9 candle power and 575 B.Th.U.; the water gas, 27·5-candle power and 690 B.Th.U.; the mixed gas experimented with, 25-candle power and 665 B.Th.U.

As is to be expected, the colour temperature of a flame is within certain limits dependent upon its shape, size, position, and composition of the gas. It will also vary in different parts of the flame—the values given above being integral over the entire surface. It will be noted the full flames are slightly whiter than the ordinary 4 W.P.H.C.P. carbon standards. Their colour temperature of 1870° for the mixed gas-flame given by Hyde and Forsythe in the paper referred to is considerably lower than any of the above values, which represent extremes in illuminating gas characteristics.

* See "JOURNAL," Vol. CXXXVIII., p. 65.

Société Technique du Gaz "Transactions."

Military exigencies have not prevented the preparation of a substantial volume for the year 1916 by the Société Technique de l'Industrie du Gaz en France; but, of course, the book does not consist solely of "transactions," properly speaking. There is a verbatim report of the proceedings at the annual general meeting which was held in Paris on June 9 last year; and the Committee reports include one on the distillation of wood. This is followed by the Government decree recognizing the Société as an organization of public utility, and by the rules. Members will find useful a list and references, arranged in order of subjects, of articles which have been dealt with in the Société's bibliographical review from 1908 to 1910 inclusive, as well as the tables of contents, placed in order of date, of the legal review contained in the reports up to the 1914 congress. These matters take some 200 pages; and a like amount of space is occupied by lists of members (both in alphabetical sequence and under the names of their towns), the names of those who have passed away, a brief account of the Société's doings in the period from 1874 to 1916, the names of officers and committee members for each year between these dates, and lists of the gold medals bestowed on inventors and of prizes awarded to workmen and other employees in the industry since the foundation of the Société. Considering the circumstances, the volume represents a really large amount of work on the part of those concerned. At the close of the war a "Livre d'Or" will be prepared by the Société, giving the names of the members of the French gas fraternity who have fallen victims to the war—killed, wounded, died of wounds, prisoners, and missing—as well as those who have received military decorations or been mentioned in despatches. On Oct. 1, 1916, these lists comprised 1654 names.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

The Elimination of Tar Fog.

SIR,—In your last issue, when describing the Fisher-Fiddes patent extractor, I read with surprise the statement "that those of the 'P. & A.' type quickly block-up and become inefficient."

Now I venture to think that I have had a more extended experience with "P. & A." tar-extractors, both in the original form and with subsequent modifications, than perhaps any other British gas engineer. I have erected scores of them on the Continent, and do not consider a gas-works properly equipped unless extractors are fitted; and I have never experienced a single instance, except one, where they have failed to fulfil their duty of completely removing "tar fog." It is astonishing the time they will work without cleansing or attention.

The only failure I can call to mind was in the case of a new and excellent machine I sent from the Continent to a London suburban gas-works, which, after working a few months, was sent to the scrap heap. On investigating the matter, I found that the most appalling ignorance had been shown in the fixing and in the position of the machine.

The enclosed type of machine (placed on the market by Messrs. Holmes & Co., of Huddersfield) is an excellent type, and only recently has been put to severe tests by myself.

At our low-temperature carbonizing works at Battersea, where we naturally produce very rich and tarry gases, especially from shales and cannels, we had much difficulty, in spite of almost excessive condensation, in preventing tar deposits choking the vacuum pump. But since the erection of the Holmes "P. & A." extractor, which works under a vacuum of over 20 inches of mercury, every trace of tar fog is removed and the vacuum pump is not affected.

If there has been any failure in types of "P. & A" extractors, it can be traced: (1) To the machine being erected in the wrong place; and (2) being too small for the work it is required to do.

19, *Queen Anne's Chambers, S.W.* F. D. MARSHALL.

P.S.—My view is that the "P. & A." types will work better under vacuum than under pressure.

[The experience of Mr. Marshall is interesting, and it "hits straight from the shoulder" in favour of the "P. & A." extractor. The hints as to the causes of inefficient working will probably be useful to engineers who are experiencing trouble. That the trouble is not confined to this country is seen from an article in our columns on June 12 [p. 519], headed "A Comparison of Operating Results at Twenty Gas-Works in Illinois." In the course of the information supplied, it is stated: "Frequently the supply of water to the condensers was insufficient; and the 'P. & A.' apparatus was by-passed on account of back-pressure." The high standard of tar fog removal now required, though always desirable, has been brought about by the introduction of the oil-washing process.—ED. G. J.]

Adulteration of Gas Coal.

SIR,—No gas engineer is likely to question the accuracy of the references made by yourself and correspondents to the general quality of the mineral now being supplied under the title of "Gas Coal." Apart from the financial considerations involved in the purchase of worse than useless mineral matter at 30s. or so per ton, it is attended with increased difficulty all round, from the mine to the retort-house. The labour incidental to loading and unloading, the rail and road haulage, the carbonizing, and the attention to the retort-furnaces are all more than proportionately increased—and this at a time when we are urgently requested, as a national duty, to cut-down all these items to the lowest practicable point.

In this connection, I would like to ask if others besides myself have been troubled with pitchy deposits at any point between the condensers and scrubbers, to an extent that was unknown in pre-war days. This is possibly due to the higher heats and fiercer firing necessary to get anything like a decent make of gas per ton of coal carbonized. At any rate, it occurs to an extent that excludes mere chance or accidental happening. Condensers and scrubbers, or the connecting pipes, that formerly ran several years without attention, now require a thorough clean-out every summer. In one instance, notwithstanding a foul main of ample capacity and length, laid in accordance with the plan that I adopted many years ago, with a fall towards, and into, the hydraulic main, which has answered excellently for 25 years or so, trouble was traced to pitchy deposits in the exhauster connections—quite a new experience. In another instance, excessive back-pressure was traced to clogging of the wood grid packing in a scrubber that was thoroughly cleaned last year. The necessary labour is extraneous, not suited to women or substitutes; there is difficulty in getting it done at any price; and the time lost by standing-off for cleaning means a loss of what is admitted by the Government to be valuable fertilizing material. Obviously, the adoption of tar or oil washing has nothing to do with the trouble, as it occurs previous to that treatment.

The question of the quality of a coal, as regards percentage of mineral content, apart from that of comparative values of various descriptions, calls for full consideration in connection with all matters affecting transport and labour, and especially the reduction of average mileage, by compelling gas undertakings to use the nearest local coal. The conveyance of coal from Durham to South Wales has been cited as an awful example. If all kinds of coal were approximately equal in gas and coke yielding properties, no matter where raised, the suggestion that a *pro ratâ* reduction of average mileage means an equivalent relief to transport traffic might hold good. But as things are, it is an utter fallacy; and if put in force, without fair consideration of all local

conditions and circumstances, it will not only tend to defeat the object in view, but it will amount to an additional infliction on the already long-suffering gas industry—in some cases of a magnitude exceeding others that it has been called upon to endure the last three years.

It is possible that in some cases the long distance preference is simply due to prejudice. But there is not much room in these days for a man at the head of affairs who cannot figure in hard-headed £ *s. d.*; and I venture to claim that, as a general rule, the coal for gas making is purchased on well-matured considerations and comparisons as to actual intrinsic value, in which the bare cost is a mere incident. Such things as yield and quality of gas and coke must not be overlooked; and it is especially necessary to "humour" labour to the greatest practicable extent. Even on financial considerations only, the rights not only of the undertaking but of the consumers of gas should not be overlooked. But if these have to give place to urgent national necessity, the manager may be brought to the verge of a complete breakdown, by being forced to use an inferior local coal that reduces the make per ton 20 or 25 p.ct.; will not give a coke suited to its own carbonization; overtaxes a plant attenuated by long-deferred renewals; and upsets the highly tensioned labour question. It may add to the shortage of coal in general the not much less trouble of shortage of the proper kind; and any reduction of transport in the way of shorter average mileage will be largely discounted by increased tonnage, as the cost of coal conveyance is a matter of weight, irrespective of quality. Any interference with free choice in selection of the coal to be purchased requires consideration from many points of view, other than the bare reduction of average mileage.

Salisbury, July 7, 1917. N. H. HUMPHRYS.

Sulphuric Acid.

SIR,—Dr. Addison is reported to have said in the House of Commons, in his speech on the 28th ult., that the sulphuric acid producing capacity of the country has been increased to more than fifteen times what it was before the war, while it is being produced at much less cost.

No doubt you have noticed this; and those who have to pay two to three times as much now as in pre-war days will naturally want some more information on the subject.

Can you, or any of your readers, offer any explanation as to what Dr. Addison meant by saying that acid was now being made at less cost?

155, Norfolk Street, Sheffield, July 3, 1917. RICHARD JONES.

REGISTER OF PATENTS.

Removing Carbon Deposit from Retorts.
No. 106,910.

BARK, W. T., of Tenterden, Kent.

No. 11,830; Aug. 21, 1916.

The means proposed for effecting the removal of carbon deposit is to provide a retort lid having an opening (valve controlled) at or near the bottom of the retort to admit air. In alignment with, and in continuation of, this opening in the lid is an air-duct, of refractory material, which terminates short of the end of the retort, so that when the ascension pipe at the charging end is opened a current of cold air is created which traverses the air-duct, issues at the end, returns along the retort, and finds an exit by the ascension pipe. This "fresh air supplies oxygen to the heated carbon deposit on the walls of the retort, causing combustion, so that it burns away in the form of gas which passes out at the top of the ascension pipe."

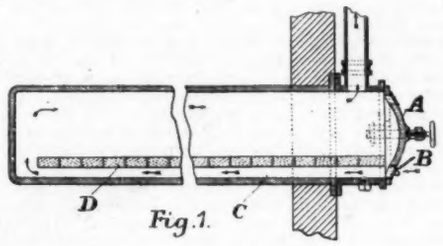


Fig. 1.

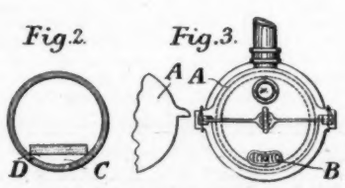


Fig. 2. Fig. 3.

Bark's Retort-Carbon Remover.

Fig. 1 is a vertical longitudinal section of a retort; the ordinary lid being removed and a separate loose lid having an air opening according to the present invention hung in its place. Fig. 2 is a vertical transverse section. Fig. 3 is a front end elevation.

According to the preferred form of the invention a loose or supplementary lid A is provided for the retort having an opening B near the bottom controlled by a valve designed to admit a supply of air. In continuation of the opening in the lid is (within the retort) an air-duct C. The supplementary lid is intended to be used on any retort in which it is desired to burn-off the carbon deposit.

The air-duct is formed by a horizontal partition D of refractory material, which terminates short of the inner end of the retort. The duct is constructed of sectional slabs of refractory material extending across the bottom of the retort and leaving an air-way beneath as shown, and "they can be readily pushed into place from the mouth of the retort."

Coin-Operated Gas-Meters.—No. 106,911.

WILSON, J. H., of Coventry, and WILSON, G., of 's-Gravenhage, Holland.

No. 11,845; Aug. 21, 1916.

This invention has for its object to provide a device for receiving two or more coins of different value to secure a proportionate supply of gas. The mechanism comprises a rotatable receiving-member in the form of a drum or plug having slots in it to receive the coins. The connection between the drum and the meter mechanism is effected by the coin itself, which partly projects from the slot in the drum and enters the teeth of another rotatable part constituting the setting member for the meter. The rotatable coin-receiving member has a receiving channel or slot provided with means for retaining a larger coin at its upper or feeding-in end, but which means will allow a smaller coin to pass to the bottom end. The ends are disposed in such relation to opposite sides of the toothed setting-member that the two coins will engage the member at different points; so that the receiving member when rotated will travel a greater or smaller distance before discharging the coin, according to whether a large or small coin is engaging the setting member.

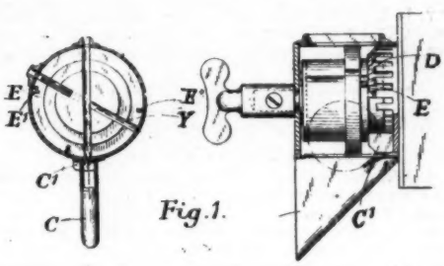


Fig. 1.

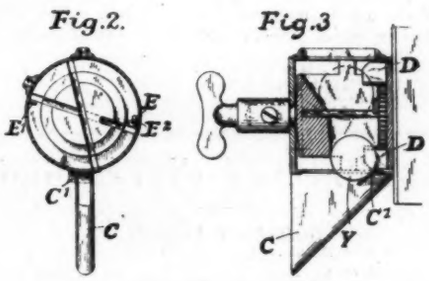


Fig. 2. Fig. 3.

Wilson's Two-Price Prepayment Meter.

Fig. 1 is a side elevation and section of the coin-receiving mechanism with the setting member—the enclosing casing being in section for the sake of clearness. Fig. 2 shows the interior movable plug in a different position. Fig. 3 is a similar view, but with the inner plug in section along the shilling and sixpenny slot with the parts in position for discharging the sixpence.

The operation of the device is as follows: When a coin is to be placed in the slot, the plug is turned as far as it can be in the counter-clockwise direction, so that a pin E on the plug is brought against a pin E^1 on the casing. If a penny is then dropped into the slot it will fall to the bottom, but will be prevented from leaving the casing by a lip C, which makes the lower part of the discharge-aperture too narrow for it to pass. The penny will project from the face of the plug and enter between two of the teeth D of the setting-up member, so as to lock the plug. If, now, the plug is turned in a clockwise direction, the penny will be carried along, and the setting-member with it, until the lowest part of the penny which projects down into the delivery-orifice is brought against an inward projection on the casing at the end of the discharge-aperture. This checks the movement of the plug, and directly the operating-handle is released the penny will drop through the discharge-opening at the side of the lip C, and will so fall into the collecting chamber. This movement of the plug will have effected the movement of the setting member the distance of one tooth, and gas will be delivered to the value of 1d. If any coin smaller than a penny is placed in the slot when the parts are in the position first shown, it will not be retained by the lip C, so that it will drop into the trough below, which extends forward to an opening in the front of the meter, so that the coin will be returned to the consumer.

If a shilling is placed in the slot, it remains at the top, because the lower part of the slot is too narrow to accommodate it. The shilling thus engages the teeth of the setting-device at a point which is at a considerable angular distance from the discharge outlet for the shillings. The plug therefore has to be turned through an angle of nearly 180°, so that the parts are brought to the position shown in fig. 2, when the shilling drops out through the aperature in the casing and the setting device has been rotated through an angular distance which will ensure a quantity of gas equal in value to 1s. being delivered. The plug is

prevented from being turned beyond the discharge-position for the shilling by the pin E being brought against a pin E^2 on the casing.

If a sixpence is placed in the slot, this will drop to the bottom of the slot as shown at Y, where it is arrested by the casing; but it will engage the teeth D of the setting-member, and thus, when the plug is turned, it will cause the setting-member to be carried forward until the sixpence is brought against a stop, when it will drop through the delivery-opening. The sixpence is carried over the return shoot C in the same way as the penny, as the space provided between the back of the slot A and the lip C is not sufficient to allow the sixpence to drop until the lip has been passed. The distance through which the plug is moved for a sixpence is half that through which it is moved for a shilling; so that a corresponding proportion of gas will be supplied.

Diaphragm for Gas-Meters.—No. 106,991.

SMITH, E. W., of Kennington Park Road, S.E.

No. 7183; May 18, 1917.

This invention relates to a form of diaphragm in which a metal plate or disc is mounted upon flexible material, usually leather, with the object of strengthening the diaphragm by increasing the rigidity of the metal plate by forming it with radial ribs or corrugations extending the greater part of the distance from the centre to the edge of the plate.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for July 4.]

Nos. 9071—9495.

BENTLEY, J. E.—"Automatic gas or fluid governors." No. 9387.
BOLTON, D. C.—"Gas-turbines." No. 9150.
CALVERT, G.—"Manufacture of cyanide and cyanogen compounds." No. 9379.
CHRISP, G.—"Effecting continuous absorption of a gas or some constituent of a gas by means of a solid absorbent." No. 9211.
COWEY, L. E.—"Means for measuring the rate of flow of liquids." No. 9484.
CUTLER, S.—"Manlids for gasholders." No. 9324.
DRAKE, J. W., and DRAKES, LTD.—"Apparatus for removing coke discharged from retorts or furnaces." No. 9188.
GOWER, H.—"Gas-lighter." No. 9158.
HUTCHINS, T. W. S.—"Retorts or furnaces for the destructive distillation and carbonization of carbonaceous materials." No. 9234.
KOPPERS, H.—"Door for furnaces, retorts, &c., for producing gas, coke, &c." No. 9402.
SOMERVILLE, J. M., and the SOUTH METROPOLITAN GAS COMPANY.—"Apparatus for washing gas or for impregnating liquids." No. 9282.
TAYLOR, G.—See Chrisp. No. 9211.
WATTS, C. J.—"Gas-heated radiator or stove." No. 9400.
WEBB, A. M.—"Liquid and gas contact apparatus." No. 9452.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Provisional Orders Bill.

The Gas and Water Provisional Orders Bill was brought from the Commons, read the first time, and referred to the Examiners.

Sheffield United Gas Company's Bill.

This Bill, promoted by the Sheffield Gas Company, was in a list of Opposed Bills which came before a Committee of the House of Lords last Tuesday, presided over by Earl Kintore. During the day, however, it became known that the opposition of the Sheffield Corporation, who were the only opponents, had been withdrawn, and that the Bill was to be sent to the Unopposed Bills Committee. The measure has already passed the House of Commons, when the Corporation refused to discuss clauses after the Committee had found the preamble of the Bill proved. We understand, however, that with the exception of a new clause regarding the breaking-up of roads, which has been agreed with the Corporation, the Bill remains in the same form as when it left the House of Commons.

HOUSE OF COMMONS.

The Lighting Restrictions.

Mr. HINDS asked the Home Secretary whether he would announce at an early date the intentions of the Government as to lighting restrictions during the coming autumn and winter; and whether, in the event of the restrictions being renewed, it would be found practicable to fix settled monthly times for darkening throughout the country as in London, instead of daily alterations regulated by the sunset hour.

Sir GEORGE CAVE replied that an announcement with regard to the lighting restrictions during the autumn and winter would be made in due course, if any modification of the existing orders was considered desirable. He would consider the suggestion in the latter part of the question.

In connection with the newly-installed ammoniacal liquor plant at Stockport, the Engineer recently reported to the Gas Committee that a small quantity of sulphate of ammonia was now being produced and sold to allotment holders and private gardeners in the district.

LEGAL INTELLIGENCE.

LIGHTING CONTRACTS AND THE WAR.

An action which was declared by the Judge to be indistinguishable in principle from the well known one decided by the Court of Appeal, of the Leiston Gas Company *v.* Leiston Urban District Council, came before Mr. Justice Bailhache in the King's Bench Division last Tuesday, when the Wycombe Borough Electric Light and Power Company, Ltd., successfully sought to recover from the Wycombe Corporation a sum of £1290 under an agreement to supply electricity for the public lighting of the borough. On the other hand, the Corporation contended that they were entitled to a sum in excess of the amount claimed, in consequence of the lamps remaining unlighted; and they counterclaimed for the deduction of whatever might be necessary.

Mr. POLLOCK, K.C., M.P., explained that the action was brought to recover instalments due under an agreement, dated Oct. 3, 1911, made between the Company and the defendants; and the point was whether or not, in a case where the lighting had been restricted by orders under the Defence of the Realm Regulations, the plaintiffs were entitled to recover the quantum which was due to them under the agreement, or whether the defendants were entitled to say that the agreement had been put an end to by the circumstances which had arisen, and that the quantum upon which payment was based was no longer applicable, because, in fact, the amount of light contemplated by the agreement had not been delivered. The Corporation relied on a penalty clause in the agreement which provided:

> In case of any default in lighting the lamps or any of them, or if the same shall remain unlighted or be suffered to go out during the times in which the same ought to be lighted, as aforesaid, from any cause whatever, the Corporation shall be at liberty to deduct from any payment to be made the sum of 3s. per night for each of the arc lamps and the 800 c.p. lamps, and the sum of 8d. per night for other lamps in respect of which such default or negligence shall be made or incurred, or which shall so remain unlighted or be suffered to go out, provided always in case any deficiency or default shall take place in lighting lamps notice shall be given in writing and left at the office of the works within 48 hours after such deficiency or default has occurred.

No such notice was, however, given in this case to comply with the penalty clause. The facts were really agreed between the parties.

Mr. MATTHEWS, K.C. (on behalf of the Corporation), submitted that this action was not governed by the Leiston case. In the latter there was no right to demand certain sums of money in the event of failure to light. He argued that the contract was divisible; and the defendants were only liable to pay for the lamps which were lighted.

His LORDSHIP said the Corporation were not only paying for light, but for a good many other services and accessories. He was satisfied that the words in the penalty clause "from any cause whatever" were limited to causes in which there had been some default or negligence on the part of the Company. This being so, there was no distinction between the present case and that of the Leiston Company. Judgment would therefore be for £1290, with interest at 4 p.ct. until payment—notice of appeal to be given within fourteen days.

Spurious "Nico" Mantles.

At the Guildhall, on Monday of last week, before Alderman Sir John Baddeley, Bernard Usick, wholesale gas-mantle manufacturer, of Hornsey, was summoned under the Merchandise Marks Act, 1887, for having unlawfully had in his possession for sale inverted gas-mantles to which the registered trade mark "Nico" had been unlawfully applied. There were three other summonses for having in his possession mantles to which a false trade description had been applied, and for having sold such goods. Mr. Travers Humphreys, for the prosecution, which was instituted by the New Inverted Gas-Lamp Company, said the defendant offered the prosecutors some mantles for sale which he said were their own mantles. It was no uncommon thing in the trade for mantles to get into the hands of dealers, who subsequently offered them back to the manufacturers. When the defendant delivered the mantles marked "Nico" to the prosecutors, they at once saw they were not genuine, but of inferior make. The defendant was asked to explain how he became possessed of them, but refused to answer any questions. Inquiries were made, and summonses were applied for and served upon the defendant, who then went to the prosecutors and asked them to withdraw the proceedings, offering to give them the information they required. He had since given all information as to where he bought the mantles, the price he paid, &c.; and so, the object of the prosecutors having been attained, he (Mr. Travers Humphreys) asked permission to withdraw from the prosecution. Sir John Baddeley said, as the defendant had made full amends and given every satisfaction to the prosecutors, and as it was not an offence against the public but against the individual, he would accede to the application and allow the summons to be withdrawn.

Islington Public Lighting.—The Islington Borough Council have been notified by the Gas Light and Coke Company that, from the date of recording meter-indices for the Midsummer quarter, the price of gas supplied to street-lamps (except where a fixed annual charge is made under contract) will be increased by 5d. per 1000 c.ft.—*i.e.*, from 2s. 8d. to 3s. 1d.

The "Price of Gas at Doncaster."—With reference to the paragraph that appeared on p. 638 of the "JOURNAL" for the 26th ult., purporting to deal with a proposal to increase the price of gas at Doncaster (and which was the subject of a contradiction by Mr. Robert Watson in our last issue), the correspondent who was responsible for the item says that the place named should have been Dewsbury, and not Doncaster.

DIRECTIONS
OF
THE CONTROLLER OF COAL MINES,
Dated 4th July, 1917,
FOR THE PURPOSE OF RE-ORGANIZING THE
TRANSPORT OF COAL BY PUBLIC RAILWAY FOR INLAND CONSUMPTION.

Issued under Section 3 of the Coal Transport Order, 1917, made by the Board of Trade under Regulations 2 F. to 2 J.J. and 9 G. of the DEFENCE OF THE REALM REGULATIONS.

(1) No person shall, after the 8th September, 1917, without the consent of the Controller of Coal Mines, buy or sell, or offer to buy or sell, coal to be forwarded by public railway for inland consumption to any area other than those to which the coal in question may be so forwarded under the Coal Transport Re-organization Scheme, as set out in these directions.

(2) For the purposes of the aforementioned scheme, Great Britain has been divided into areas numbered from 1 to 20 on two maps* of England and Wales and of Scotland respectively, and the following table shows the areas to which coal produced in each of the areas specified in the first column may be forwarded by public railway for inland consumption for the purposes indicated in the second, third, and fourth columns.

Area of Production.	Areas to Which the Forwarding of Coal by Public Railway for Inland Consumption is Confined by these Directions.		
	Steam and Manufacturing.	Gas and Cokeing.	House.
No.	Area No.	Area No.	Area No.
1. Northumberland	1, 2, 3.	1.	1, 2.
2. Cumberland	2.	2.	2.
3. Durham	2, 3.	2, 3.	2, 3.
4. Lancashire	4, 6.	4.	4.
5. Yorkshire	3, 4, 5, 7, 8, 10, 11, 14, 16.	4, 5, 7, 8, 10, 11, 13, 14, 16.	4, 5, 7, 8, 10, 11, 14, 16.
6. North Wales	6.	6.	6.
7. North Stafford	6, 7, 9.	7, 9, 10.	6, 7, 9.
8. Eastern Counties	—	—	—
9. Shropshire	9, 12, 13.	9, 13.	9, 12, 13.
10. Birmingham and District	9, 10, 11, 13, 14.	—	9, 10, 11, 13, 14.
11. Northants to Essex	—	—	—
12. South Wales and Monmouthshire	12, 13, 14.	12.	12, 13.
13. South Western Counties	13.	13.	13.
14. South Eastern Counties and London	14.	14.	14.
15. Derby and Nottingham	4, 6, 7, 8, 10, 11, 13, 14, 15, 16.	4, 7, 8, 10, 11, 14, 15, 16.	4, 6, 7, 8, 11, 14, 15, 16.
16. Leicester	10, 11, 14, 16.	—	10, 11, 14, 16.
SCOTLAND.			
17. South Eastern	17.	17.	17.
18. North Western	18.	18.	18.
19. North Eastern	17, 18, 19.	19.	17, 18, 19.
20. South Western	18, 20.	20.	20.

(3) In accordance with the provisions of Sections 2 and 3 of the Coal Transport Order, 1917, every contract for the sale of coal is hereby abrogated as from 6 p.m. on the 8th September, 1917, in every case in which this is necessary, in order that the re-allocation of the supplies of coal, as provided for in clause 6 of these directions, may be effected.

[On and from September 10th, new contracts for the sale of coal affected by the scheme will come into operation, and all necessary arrangements to this end must be completed not later than September 8th, but it is obviously desirable that completion should be reached as much in advance of that date as possible.]

(4) Every Colliery Owner shall, on receipt of instructions from the District Coal and Coke Supplies Committee in whose area the Colliery is situated, furnish the Committee with returns giving the following information as respects forwardings by public railway, for inland consumption during June, 1917, of each description of coal produced at the Colliery :

(*a*) In the case of coal sold direct to consumers or retail merchants, the name and address of the consumer or retail merchant, and the tonnage of each description forwarded by rail to each in the area specified by the Committee, for each of the following purposes : (*a*) Steam-raising and Manufacturing, (*b*) Gas-making, (*c*) Coke-ovens, (*d*) Household use.

(*b*) In the case of coal sold to factors and wholesale merchants, the name and address of the factor or wholesale merchant and the tonnage of each description forwarded by rail to each in the areas specified by the Committee, for each of the following purposes : (*a*) Steam-raising and Manufacturing, (*b*) Gas-making, (*c*) Coke ovens, (*d*) Household use.

(*c*) In the case of every consignment of coal during June, the destination of which was unknown to the Colliery Owner, the name, address, and business of the purchaser and the weight and description of each consignment.

(*d*) Such information as to the provision of wagons as the Committee may require.

Every Colliery Owner shall furnish the above returns to the District Coal and Coke Supplies Committee, so as to be in the hands of the Committee within seven days of the date of the despatch of the instructions by the Committee to the Collieries in their area.

(5) In every case in which the area of consumption of coal sold to a factor or merchant is unknown to the Colliery Owner, the District Coal and Coke Supplies Committees will apply to every such factor or merchant for a statement giving, as respects such coal, the tonnage of each description forwarded by rail for consumption in each of the areas as referred to in clause 4 of these directions, for each of the purposes named therein (*a*) Steam-raising and Manufacture, (*b*) Gas-making, (*c*) Coke-ovens, (*d*) Household use, and every such factor or merchant shall furnish such return to the Committee so as to be in their hands within three days of the date of application.

In cases where coal is sold by one factor or merchant to another, and the area of consumption of the coal is unknown to the seller, the seller shall state on the above-mentioned return the name and address of the purchaser and the weight and the description of coal in each case.

(6) On receipt of the returns specified in clause 4, the District Coal and Coke Supplies Committees will arrange for meeting the requirements of purchasers whose supplies have been affected by the Scheme, out of the tonnage of coal which will be available and sufficient for the purpose, by diversion from other areas under the operation of the scheme. This tonnage will consist of the following :

(*a*) The tonnage of coal hitherto forwarded by public railway from the areas specified in the first column of the table shown in clause 2 of these directions, to areas other than those specified in the second, third, and fourth columns as permissible areas for the coal in question.

(*b*) Such portion of the tonnage hitherto forwarded to other areas as it may be necessary for the Committee to divert under detailed instructions from the Controller of Coal Mines.

The District Coal and Coke Supplies Committees will inform each of the Colliery Owners in their area of the tonnages (if any) to be diverted from these areas, and will specify the factors, merchants, and direct consumers, whose supplies are to be reduced or discontinued, with the descriptions and quantities of coal to be diverted from each.

[*Continued on next page.*]

* Copies of these maps, also a diagram illustrating the effect of the Scheme on the Area interchanges have been prepared by the Railway Clearing House, and may be obtained, with a pamphlet embodying full instructions, by all concerned, post free, on application to the Secretary, Railway Clearing House, 123, Seymour Street, London, N.W. 1.

(7) The whole tonnage of coal diverted under the operation of the scheme as mentioned in clause 6 shall be reserved by the Collieries for disposal in accordance with instructions to be given by the District Coal and Coke Supplies Committee, who will notify each Colliery Owner in their area of the factors, merchants, and direct consumers to whom the coal is to be supplied after the 8th of September, 1917, and of the descriptions and quantities to be supplied to each.

(8) The Collieries will then communicate direct with the factors, merchants, and direct consumers allotted to each, and in offering the authorized weight and description of coal will, at the same time, state whether wagons can be supplied by the Colliery. If the Colliery is unable to provide wagons or can provide only a portion of them, this must be stated when offering the coal, and the factors, merchants, and direct consumers asked if they can provide wagons.

In cases where factors, merchants, and direct consumers state they are unable to provide wagons, the Colliery must at once notify this, with full particulars, to the District Coal and Coke Supplies Committee, who will then endeavour to arrange for supplies of wagons, and if unable to do so, report the circumstances to the Controller of Coal Mines. It must, however, be understood that where factors, merchants, and direct consumers are to-day providing the wagons for the existing supplies which are to be discontinued as from the 8th September, under the instructions of the District Committee, they must continue to provide wagons for the new supplies substituted by the Committee, except in cases where the Collieries indicate their ability to meet demands with their own wagons or those of railway companies.

(9) Every colliery shall notify all factors, merchants, and direct consumers to whom coal has been sold, the delivery of which will be affected by the scheme, of the discontinuance or reduction of supplies as from the 8th September, 1917. Such notifications shall be made:

(*a*) In the case of coal forwarded to areas prohibited under clause 2 of these directions, as soon as possible after the publication of these directions:

(*b*) In the case of coal forwarded to other areas in reduced quantities, as soon as possible after the receipt of instructions from the District Coal and Coke Supplies Committee as to the factors, merchants, and direct consumers whose supplies will be affected.

(10) These directions are designed so as to leave the initiative with the District Coal and Coke Supplies Committees. Factors, merchants, and direct consumers whose supplies after the 8th September, 1917, are affected by the scheme are not to apply to Collieries for supplies in substitution, but must wait until they receive communications from such Collieries as are instructed by the District Coal and Coke Supplies Committees to provide the supplies required under the scheme. Provided that if any factor, merchant, or direct consumer does not hear from a Colliery or Collieries respecting such supplies as affected under the scheme by August 27th, a communication shall at once be sent to the District Committee controlling the area responsible for supplying such factor, merchant, or direct consumer, furnishing details of the quantities and description of coal required, together with the names of Collieries from whom such supplies were actually drawn, and would continue to be drawn up to 6 p.m. on September 8th, 1917. Also that if a Colliery has not, by August 20th, 1917, received particulars of the allocation of its coal which is being displaced under the scheme it shall, on that date, communicate with the District Coal and Coke Supplies Committee concerned.

(11) The Controller of Coal Mines will furnish the District Coal and Coke Supplies Committees with information regarding the present distribution of certain special descriptions and qualities of coal which are required for certain purposes, such as for coke ovens, gas producers, and automatic stokers, and the names of firms who are entitled to priority in respect of their requirements of such fuel. Such firms will receive certificates issued by the Controller of Coal Mines entitling them to receive specified supplies of the special fuels mentioned in the certificate, and the Committees will take steps to provide the fuel in question, by diversion, where necessary, from firms who have not received certificates.

Every person shall comply with the instructions of the District Coal and Coke Supplies Committees with regard to the distribution of descriptions and qualities of coal, which it may be necessary to deal with, as special fuels under this clause.

(12) These directions do not affect:

(*a*) Coal conveyed to a port for shipment, whether for export, coastwise, or bunkers.

(*b*) Coal conveyed otherwise than by public railway from the Colliery.

(*c*) Anthracite.

In the case of rail-borne coal transhipped for delivery by barge or to be delivered by road vehicle, the point to which the traffic is forwarded by public railway is to be regarded as the destination for the purpose of complying with these directions.

(13) These directions may be revoked or varied by the Controller of Coal Mines as occasion arises.

GUY CALTHROP, Controller of Coal Mines.

EXPLANATORY NOTES.

The Scheme outlined in the foregoing Directions will, it is estimated, effect a saving in railway transport of not less than 700 million ton miles annually.

A.—Coal already being produced and consumed within the one area is ignored, and therefore it will not be necessary, as a rule, to interfere with existing contracts or sales affecting such coal.

B.—The District Coal and Coke Supplies Committees will deal with all coal affected by the scheme. There will be no need for factors, merchants, and direct consumers to take any steps under the scheme. They will simply wait until they are communicated with on the subject, except so far as the position is governed by clause 10 of the Directions.

C.—The District Committees, acting for the Controller of Coal Mines, have full powers to deal with the scheme as a whole, and are to be the medium for clearing up any doubtful points which may arise.

D.—As an organization designed to relieve transport, the scheme has been based on four main issues:

(1) That consumption of coal should take place as near the producing point as possible.

(2) That in view of the superior facilities afforded by the main Trunk Lines, the movement of traffic should follow these routes wherever possible.

(3) That the movement of coal should, as far as possible, be in well-defined directions—viz.: North to South, North to South-East, North to South-West, East to West.

(4) That an area producing less coal than suffices for its own needs should not send any portion of its output to other areas. That an area producing more coal than it requires for consumption within the area itself, should only distribute the balance to adjacent or convenient areas.

E.—The only limitation in regard to the foregoing clause (4) is the need for providing coal of a special type for certain purposes (this need has been determined by getting in touch with consumers direct), and is referred to in clause 11 of the Directions.

F.—All concerned are strongly advised to secure a map, diagram, and pamphlet as indicated in the footnote to clause 2 of the Directions, as these documents will be found to be of material assistance.

G.—It is emphasized that this scheme does not affect waterborne coal, either export, coastwise, or bunkers, anthracite or coke of any description.

H.—A List of the District Committees governing the various areas, together with the names and addresses of Secretaries, is appended:

No.	Area.	Secretary of District Coal and Coke Supplies Committees.
1.	Northumberland	R. Guthrie, Esq., Coal Trade Office, Newcastle-on-Tyne.
2.	Cumberland	T. P. Martin, Esq., 19, Falcon Street, Workington.
3.	Durham	R. Guthrie, Esq., Coal Trade Office, Newcastle-on-Tyne.
4.	Lancashire	Sir T. R. Ratcliffe Ellis, 18, King Street, Wigan.
5.	Yorkshire	
	South Yorks Collieries	Messrs. Parker, Rhodes, and Co., 14, Moorgate Street, Rotherham.
	West Yorks Collieries	A. B. Smith, Esq., Central Bank Chambers, Leeds.
6.	North Wales	W. H. Haswell, Esq., Elwy House, King Street, Wrexham.
7.	North Stafford	Major J. Selby Gardner, Cannock, Stafford.
8.	Eastern Counties	W. Saunders, Esq., Bank Chambers, London Road, Derby.
9.	Shropshire	Major J. Selby Gardner, Cannock, Stafford.
10.	Birmingham and District	Major J. Selby Gardner, Cannock, Stafford.
11.	Northants to Essex	W. Saunders, Esq., Bank Chambers, London Road, Derby
12.	South Wales	Finlay A. Gibson, Esq., Park Place, Cardiff.
13.	South-Western Counties	J. G. Dennehy, Esq., Albion Chambers, Bristol.
14.	South-Eastern Counties and London	W. Saunders, Esq., Bank Chambers, London Road, Derby.
15.	Notts and Derby	W. Saunders, Esq., Bank Chambers, London Road, Derby.
16.	Leicester	W. Saunders, Esq., Bank Chambers, London Road, Derby
	SCOTLAND.	
17.	South-Eastern Counties	R. Baird, Esq., 105, St. Vincent Street, Glasgow.
18.	North-Western Counties	
19.	North-Eastern Counties	
20.	South-Western Counties	

MISCELLANEOUS NEWS.

CO-PARTNERSHIP IN WARTIME.

The Case of the South Metropolitan Company.

Writing in the July issue of the "Co-Partnership Journal," Mr. Charles Carpenter, D.Sc., the Chairman of the South Metropolitan Gas Company, makes the following remarks on the subject of the bonus:

The rate charged for gas during the past twelve months will entitle co-partners to be credited with a bonus of 3¾ p.ct. upon their salaries and wages during that period. Taking into account the fact that we have been just upon three years at war, this may be considered as not unsatisfactory; and this allotment of profits has certainly been richly merited by its recipients.

A very different state of things, however, comes into existence from to-day; for at the price to which gas has now been raised, the bonus will, for the time being, entirely disappear. Unfortunate though this be, we must extract what comfort we can by reflecting that it is quite in accord with the principles underlying our co-partnership and its bonus scale. Suppose, instead of applying co-partnership to an old one, we were starting and including it with a new gas company, how should we proceed? Having first ascertained that there was scope for a business to be built-up, and that there were possible consumers who would use our gas, the next step would be to invite people to provide money which we could use in the construction of works, the laying-down of mains and services, and the provision of stocks of coal, tools, &c. What interest should be allowed upon the money (or savings) put into our business? In the case of the South Metropolitan Gas Company, 4 p.ct. was the rate taken; and at this figure the price of gas was fixed at 3s. 1d. per 1000 c.ft. We also undertook to pay our workpeople the standard rate of wages. These three points—4 p.ct. dividend, gas at 3s. 1d. per 1000 c.ft. and current wages—formed the basis of the co-partnership between our shareholders, consumers, and employees. Let us suppose that, having got to work on the lines stated above, we found we were making more profits than sufficient to meet those obligations. We should apply the surplus, first in reducing the price of gas to consumers, and then using the balance to add to the dividend of the shareholders, and to pay a bonus to the employees. For every penny at which we sold gas below 3s. 1d., the shareholders would receive 2s. 8d. p.ct. extra in dividend and the employees a bonus of ¾ p.ct. on their wages.

When war broke out, gas was charged for at 2s. 2d. per 1000 c.ft., the shareholders were receiving on their investment a dividend of £5 9s. 4d. p.ct., and the officers and workpeople 8¾ p.ct. upon salaries and wages. Owing mainly to the greatly increased cost of coal delivered to the works (this has nearly trebled), the Board of Directors have been compelled to raise the price of gas to 3s. 1d. per 1000 c.ft.—a figure at which the extra dividend and the co-partnership bonus both disappear; and there is every likelihood of this condition continuing in force for another twelve months. How will our co-partners take this? Will they leave us and seek more remunerative employment elsewhere, or will they stay on, sharing losses with the Company as they have profits, and wait for the dawn of happier and more prosperous days? I have no doubt myself as to the result. I believe the roots of our co-partnership are too deep to be uptorn by a storm, passing though severe. I believe that the magnificent patriotism our co-partners have shown during the terrible times through which their beloved land has passed will be reflected on a lower plane in their attitude to the Company with which they are associated; for I believe they have pride in it and the good work it has been enabled through them to carry out. For the present, then, the bonus disappears; but all else of our co-partnership remains. And when the heavy clouds of to-day clear away, its sun will shine out purer and brighter because of the present period of storm and shadow.

It occurs to me that the reference to the retention of co-partners in our service might possibly be misunderstood. I need hardly say that nothing is further from my belief than the idea that the co-partner is in any way fettered by employment under co-partnership. The contrary is, of course, the case. From the most highly-placed official to the lowest-rated workman, all are perfectly free to place their services where these will be best acknowledged; and this is not incompatible, but in accord, with the principles of co-partnership.

Further on in the same issue of the "Co-Partnership Journal," there is a reply, which "adequately represents the other side of the case," to the references contained in Mr. A. E. Broadberry's recent Presidential Address to the Institution of Gas Engineers, on the subject of co-partnership under the test of war conditions. This reply, headed "Mr. Broadberry's 'Essential Features,'" is reproduced below.

We are interested in Mr. Broadberry's conception of co-partnership; for when a system is pronounced a failure, it is most important to ascertain the point of view of the person who has been disappointed. In Mr. Broadberry's mind, co-partnership "was a beautiful moral and sentimental idea, and appeared to have a sound material foundation." It "postulated," we are told, four essential features, the first of which was "security of employment for the worker." Whether it is fair to call this an "essential feature," we do not know; but undoubtedly co-partnership has a beneficial tendency in this direction. Mr. Broadberry, however, complains that employees have left his Company for higher wages elsewhere, and appears to think that this is a sign of failure. We do not admit for a moment that it is so. Co-partnership was not devised to hinder or prevent any working man who desired to better his position; and in the case of our Company it is certainly not so used—witness the number of men who have emigrated to the Colonies, taking their co-partnership accumulations with them. No proof whatever is given that co-partnership has failed to give "security of employment for the workers;" the complaint being in reality that it has not given security that workers shall remain with the employer. We suggest that, to obtain this result, co-partnership employers must keep their conditions of service as attractive as those of neighbouring industrial concerns, even in war-time.

The second "essential feature" of Mr. Broadberry's co-partnership ideal is stated to be "beneficial wage increase for good and effective combined work." Most co-partnership advocates would repudiate this definition. Profit-sharing is not meant to be regarded as "wage increase;" and a misconception of this kind is calculated to do a considerable amount of harm. The employee shares in the prosperity of the employer, due in a measure to his own efficiency and care; and if the profits of the concern fail by reason of war conditions, the co-partnership bonus may disappear for a time, though good and effective work has been done. But the worker is entitled in any case to the fair wages customary in the industry, altogether apart from any consideration of profit-sharing.

We agree with Mr. Broadberry that "accumulation of savings impossible with voluntary thrift" is a feature of co-partnership; but we are not inclined to believe it has failed in this respect, even at Tottenham. Mr. Broadberry says "there existed in many cases very considerable sums accumulated as the effect of co-partnership." This looks like success, not failure. But certain co-partners left for other employment; and Mr. Broadberry thinks, rightly or wrongly, that the handling of these accumulations was one of the inducements for their leaving. We venture to suggest that this accumulation of savings was really intended for the benefit of the co-partner, and not to keep him from leaving his employment to better himself. It may be urged that in the long run it will be proved that those men would have been wise to remain where they were, But that is beside the mark. Every man has a right to decide such matters for himself; and if a man is incapable of managing his own business, he is not of much use in the conduct of his employer's affairs.

"The unifying of all interests" is the fourth point taken up; and Mr. Broadberry dismisses it with the following cryptic utterance: "That it is impossible to co-ordinate what does not exist, requires no demonstration; and as in many cases no interest is left in co-partnership, this last point has not been upheld." We wonder what it is that "does not exist." "All interests" certainly do exist, and also the need for unification of them. Co-partnership exists, too; and in the Companies which have been administered by Sir George Livesey, and those whom his personality influenced and inspired, the principles of co-partnership have been potent in the direction of the unification of the interests of employer, employee, and consumer. Proof of this, and of the war-proof character of co-partnership as realized in South London, can be found in hundreds of letters from our brave co-partners, who so splendidly responded to the call of the greater co-partnership—their Nation—and who, please God, will one day return to assist in bringing to its highest possible development the relationship which has been the glory of our Company for nearly 28 years.

SULPHATE OF AMMONIA PRICES.

The Sulphate of Ammonia Association held a meeting at their Horseferry Road offices on June 26, to which all makers were invited, when the following resolution was unanimously passed, and has been communicated to the departments concerned:

"That this meeting of makers of sulphate of ammonia, although most willing to co-operate with the Government Departments concerned in stimulating food production, expresses its strong dissatisfaction with the prices fixed by the Government for home agricultural consumption during the season 1917-18, and considers these prices far too low, in view of the greatly increased and still increasing cost of manufacture in respect of acid, wages, lime, bags, &c., &c.

"The meeting strongly urges that, in place of the promise to 'consider,' in clause 8 of their circular letter dated June 9, 1917, the Food Production Department shall give a definite undertaking to indemnify makers of sulphate of ammonia in the event of a further rise in the price of acid being sanctioned by the Ministry of Munitions, and that in view of the increase of 10s. per ton in the price of acid which became operative on Jan. 1, 1917, full effect shall be given to clause 8 for the coming season.

"As regards munitions orders for shipment to neutral countries, the meeting desires to have an assurance that the Ministry of Munitions is prepared to act in a manner which will secure the highest possible price to British makers, and thus to the British Treasury.

"The meeting further requests most urgently that the Government Departments concerned shall ascertain the views of the makers' representatives regarding questions of price and other matters affecting the trade, before submitting proposals to the War Cabinet or other authorities, and that they shall take steps to secure that the Cabinet is fully informed of the feeling of the trade before decisions are taken."

MASSACHUSETTS BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS.

The Thirty-Second Annual Report of the Commissioners for the year ended 1916 has been issued. It is a volume of considerable bulk, and deals with a large variety of subjects. Among them it is seen the Board are making

RECOMMENDATIONS FOR LEGISLATION.

The Board state they have for many years regarded the existence of the power of a city or town to acquire a gas or electric plant, even though not exercised, an important aid to the effective public regulation of the privately owned companies under its supervision. Its value is necessarily dependent on the successful operation of such plants as have already been acquired by cities or towns. One weakness which experience has clearly developed is the insecure tenure of office of the managers of such plants, and the pressure which is frequently brought to bear upon them to permit or adopt practices with respect to the conduct of the business which will in time undermine the efficiency of such plants and the integrity of the public investments therein. The manager of the largest and most successful municipal plant in the Commonwealth was, in 1915, by Special Act, put under the civil service laws, to its distinct advantage. The Board believe that the managers of all municipal lighting plants should be brought under the civil service.

Any abandonment of public ownership once undertaken may also seriously impair the value of the existence of the power in cities and towns to engage in the business of supplying gas and electricity as an aid in the proper regulation of gas and electric companies. Considerable headway has recently been made in two important instances in projects for the sale to privately owned companies of existing municipal plants. In two minor instances such sales have occurred. The Statutes, while prescribing careful and deliberate action by cities and towns prior to acquiring municipal plants, are silent as to the steps necessary for their sale. While the question may properly be left to the ultimate determination of the cities or towns directly concerned, the Board recommend legislation prescribing the same careful and deliberate action in abandoning as in undertaking public ownership.

Cities and towns owning and operating municipal lighting plants have from the outset been required to make annual returns to the Board, and are subject to the specific authority of that body with respect to certain features of their business. They are not required,

however, to share in the Board's expenses, which have been assessed entirely upon the private companies under its supervision, although the Board have, in fact, since municipal lighting plants were first acquired, been frequently called upon for the interpretation of the Act and for advice and counsel as to accounts and the conduct of business, and still devote an increasing amount of time to them. In view of their number and importance, the Board believe that the time has come when their expenses should be assessed upon cities and towns which own municipal lighting plants as well as upon the privately owned companies.

These recommendations are embodied in the Act following:

AN ACT RELATIVE TO MUNICIPAL MANAGEMENT AND THE COMMISSIONERS' EXPENSES.

SECTION 1.—Section 113 of chapter 742 of the Acts of the year 1914 is hereby amended . . . . so that the section shall read as follows: The mayor of a city, or the selectmen or municipal light board (if any) of a town which acquires a gas or electric plant shall, subject to the rules of the Civil Service Commission, appoint a manager of municipal lighting who shall, under the direction and control of the mayor, selectmen, or municipal light board (if any), and subject to the provisions of this Act, have full charge of the operation and management of the plant, the manufacture and distribution of gas or electricity, the purchase of supplies, the employment of agents and servants, the method, time, price, quantity, and quality of the supply, the collection of bills, and the keeping of accounts. His compensation and term of office shall be fixed in cities by the city council or corresponding body, and in towns by the selectmen or municipal light board (if any); and, before entering upon the performance of his official duties, he shall give bond to the city or town for the faithful performance thereof in a sum and form, and with sureties to the satisfaction of the mayor, selectmen, or municipal light board (if any), and shall, at the end of each municipal year, render to them such detailed statement of his doings and of the business and financial matter in his charge as the Board of Gas and Electric Light Commissioners may prescribe. All moneys payable to, or received by, the city, town, manager, or municipal light board in connection with the operation of the plant, for the sale of gas or electricity or otherwise, shall be paid over to the city or town treasurer. All bills chargeable to the plant or to the appropriations therefor shall be paid by the treasurer on requisition by the manager or municipal light board (if any). The manager shall, at any time, when required by the mayor, selectmen, municipal light board (if any), or Board of Gas and Electric Light Commissioners, make a statement to such officers of his doings, business, receipts, disbursements, balances, and of the indebtedness of the city or town in his department.

SECTION 2.—A city or town which has acquired a municipal lighting plant shall not sell the same for the purpose of abandoning the distribution of gas or electricity to its inhabitants until such sale has been authorized in the manner and by the votes prescribed by sections 93 and 94 of chapter 742 of the Acts of the year 1914 for the acquisition of such plants.

SECTION 3 deletes from section 92 of the old Act the words "except for the operation of electric cars."

SECTION 4 amends section 136, which now reads as follows: All sums of money annually appropriated by the general court for the salaries and expenses of the Board, their clerks, and employees, shall be apportioned by the Tax Commissioner among the several gas and electric companies and cities and towns which have acquired municipal lighting plants; and, on or before the 1st day of July in each year, he shall assess upon each of the companies, cities, and towns its share of the sums, in proportion to gross earnings in case of companies, and to expense as defined in section 114 in case of cities and towns for the year last preceding the year in which the assessment is made; and such assessments, in case of companies, shall be collected in the same manner as taxes upon corporations are collected, and, in case of cities and towns, in the same manner as the State tax is collected.

SECTION 179 amends section 179 of the old Act, which now reads: Section 179—The amount of the expenses incurred by the Board in the inspection of gas and gas-meters, and in salaries paid therefor, less the amount deposited with the treasurer and receiver general from the fees for the inspection of meters, shall be borne by the several gas companies and cities and towns which have acquired municipal gas plants in proportion to gross earnings in case of companies, and to expense as defined in section 114 in case of cities and towns, and shall be assessed and recovered in the manner provided by section 136. If at any time, however, the amount collected under the provisions of sections 177 and 185 shall exceed the amount of such salaries and expenses, such excess shall be applied to reduce the annual assessment levied upon the several gas companies, under the provisions of said section 136 for the annual expenses of the Board.

NEW ISSUES OF STOCK OR BONDS.

Later in the report, it is stated that 22 applications for approval of issues of stock or bonds have been decided during the year. The par value of the securities asked for was $6,806,500, and the par value of the amount approved was $6,281,275. In 14 cases the full amount asked for was approved.

CALORIFIC STANDARD.

The report includes a statement by the Board as to the establishing of a calorific standard for gas, which has already been published in the "JOURNAL." [see Oct. 3, 1916, p. 38.]

CONTRACTORS AND MANAGEMENT OF GAS UNDERTAKINGS.

An order signed by the Chairman of the Board (Mr. Alonzo R. Weed) treats of the above subject. The principal parts were reproduced in our issue for Feb. 20 last (p. 340).

STATISTICAL INFORMATION.

A large part of the report is taken up with statistical information. In the issue of the "JOURNAL" for Dec. 12 last (p. 539) we gave some information relating to the progress of the gas industry in the State of Massachusetts.

SLIDING-SCALE.

Many pages of the report are occupied with a review of the conditions affecting the operation of the sliding-scale in connection with the Boston Gas Company.

At a recent meeting of the Directors of the Coatbridge Gas Company, Mr. George Braidwood, the Engineer and Manager, was granted an increase in his salary of £100 per annum.

THE ASHTON CHEMICAL WORKS EXPLOSION.

Statements which appeared in certain newspapers at the time of the explosion last month at a chemical works in the Ashton-under-Lyne district, inferring that the trouble was caused by the gasholders themselves exploding, have led to a considerable amount of correspondence in the local Press.

Mr. G. F. Handel Beard (of Messrs. R. & J. Dempster), replying to several of the letters, says that he visited the scene of the explosion 22 hours after it occurred, and the remains of the two Ashton gasholders proved conclusively that they did not explode. Had they exploded, the top and sides would have ripped outwards, and the guide-columns would have collapsed also outwards; whereas the top and sides collapsed inwards, and parts of the damaged columns were in the tanks underneath the damaged holders. Further, the few columns damaged (about seven out of 32) were those adjacent to the chemical works. Two men were close to the gasholders at the time; and if there had been an explosion in either holder, they would have been blown to pieces. The tanks suffered no damage. "My only object in writing," he says, "was to re-assure those people who have a fear of gasholders. As some (and probably most) readers are aware, it requires from four to seven parts of air to one part of gas to form an explosive mixture; and as one gasholder was full and the other half-full at the time, it was obviously impossible for the required amount of air to be drawn, or rather forced, in. As soon as the gas had all been burnt, the Engineer (Mr. Joseph Townsley) closed the valves to prevent any further gas being admitted."

Mr. H. S. Knight (gas engineer) states that he found portions of the chemical plant were blown right through the gasholders, thus evidently causing the gas to fire. The fractures in the holders had every appearance of being due to a "tearing" action applied outside. There may have been other explosions following the first one at the chemical works; but in his opinion these cannot be attributed to anything that occurred at the gas storage station. On examining the framework of the gasholders, he found that where it had fallen down it had fallen into the tank; whereas had the explosion taken place in the gasholders themselves, the framework would have fallen outwards. Personally, he thinks the "surrounding neighbourhood has a good deal to thank the gas manager for, owing to the manner in which he dealt with the unusual difficulty. Directly the holders had sunk into the tanks, the valves leading from the holders were closed, so preventing any mixture of gas and air accumulating, which would later on have caused an explosion."

MANCHESTER GAS IN THE STOCKPORT AREA.

War Time Request from the Ministry of Munitions.

At last Wednesday's meeting of the Stockport Town Council, Mr. Jacob Winter, J.P., the Chairman of the Gas Committee, in moving the minutes of the Committee, called attention to a letter received by the Town Clerk from the Ministry of Munitions with reference to the supply of gas to a firm in the area belonging to Stockport. This firm were erecting additional premises; and on the Manchester side there was a gas-main with which they would like to be connected in order to give them an additional supply if required, or if Stockport at any time were unable to cope with the demand. The Stockport Gas Committee had every confidence in being able to supply the demand, providing the department had the labour required; but upon the request of the Ministry of Munitions, the Gas Committee met specially the previous evening (Tuesday) and decided, subject to the Corporation not being in any way affected by the agreement, to allow the Manchester main to be connected-up.

Mr. M. M. M'GREGOR said they ought to be very careful in making any such agreement. While they recognized the necessity for doing everything possible to help the Ministry of Munitions and the firm in question, there was the danger that it might be the beginning of a serious state of things. By the acquisition of this particular district (Heaton Chapel and part of Levenshulme), they had obtained the right to supply them with gas. It was probably true that, owing to the war, an abnormal amount of gas was being used; but if they came to an understanding with the Ministry of Munitions and the Manchester Corporation, they ought to safeguard themselves and lay down the principle that whatever gas might be supplied to the firm from the Manchester mains should go through, and be registered by, a meter and charged to the Stockport Corporation. The Stockport Corporation should foot the bill, and then it should be charged to the firm. This would afford them the protection they had the right to claim.

Mr. WINTER, replying, said he intended to recommend this course to the Committee. He realized that they must be careful not to allow anybody to trespass on their ground. The whole matter would be dealt with very carefully by the Committee.

War Bonus at Manchester.—At a meeting of the Manchester Corporation Gas Committee, the Chairman (Mr. William Kay) reported that, in consequence of the rejection by the workmen of the terms for increased pay authorized by the Committee on June 8, he and the Deputy-Chairman had conferred with the Engineer and the Managers of the respective stations, and had interviewed representatives of the National Union of General Workers. As the result of the conferences, it was agreed that the existing war bonus, war wage, and good time-keeping bonus shall be merged into a war bonus of 10s. 6d. per week, in addition to ordinary rates of pay, to all adult able-bodied workmen employed by the Gas Committee; and to youths under 21 years of age, and to women, a war wage of 5s. 3d. per week shall be paid, in addition to their ordinary rates of pay. Such war wages are to be considered as being entirely due to the increased cost of living owing to the war. This does not apply to workmen whose wages are advanced in accordance with a trade arrangement, nor to members of the administrative, works, and distribution staff.

MOSSLEY GAS-WORKS REPORT.

Reporting to the Gas and Lighting Committee on the working of the Mossley Corporation gas undertaking for the year ended March 25, Mr. Joseph M'Nicholl (the Engineer and Manager) says the gross revenue for the year was £30,279, and the expenditure £23,688, leaving a gross profit of £6591. Deducting interest and sinking fund charges, there is a net loss on the twelve months' working of £725. Though 1200 tons less coal was used than in the preceding year, the cost was practically the same; the average price per ton being 1s. 7d. higher. The quantity of gas sent out from the works showed a decrease of 6·46 p.ct. This reduction in consumption was the result of the lighting and early closing restrictions and the operations of the Summer Time Act. The coke produced was 570 tons less, yet its sale realized over £500 more; the average increase per ton being 3s. 11d. With about 70 tons of tar less, the amount realized was £30 more. Ammoniacal liquor realized £270 less; about half of this sum being accounted for by the reduced make, which was 200 tons down, and the other half by the reduction in price. The cause of the latter reduction was the increased cost of labour and materials for the manufacture of sulphate of ammonia, and the reduction in the price realized for the latter brought about by the action of the Board of Agriculture, which resulted in the suspension of licences for export. The whole of the production since January has been absorbed by the home markets; and the price fixed for home sales was at least £3 per ton less than could have been obtained for export. The amount paid for income-tax increased from £246 for the year ended March 25, 1914, to £2286 for the year just concluded.

The gross revenue of the undertaking from all sources amounted to £30,280, and the charge on this capital for taxes and rates to £10,426 —*i.e.*, more than one-third of the total revenue. These amounts, if divided by the quantity of gas sold, work out at 4s. 5½d. and 1s. 6d. per 1000 c.ft. respectively. The amount paid to the wives and dependants of the workmen of the department serving with the Colours, was £319.

The total amount of gas sold through prepayment meters was 29,341,100 c.ft.; and the corresponding amount for the previous year was 31,618,000 c.ft. The quantity of gas made was 159,559,200 c.ft., or 11,527 c.ft. per ton of coal carbonized, in comparison with 11,389 c.ft. the previous year. The unaccounted-for gas amounted to 13·04 p.ct., against 7·79 p.ct.

VERTICALS V. HORIZONTALS AT KENDAL.

The Kendal Corporation gas accounts for the year ended March 31 last show a surplus of £578. The gross profit was £4422.

The report gives the subjoined comparison of results with Woodall-Duckham vertical retorts *v.* hand-charged horizontals—93,026,500 c.ft. annual make of gas.

Horizontal Retorts.

	£ s. d.	£ s. d.	£ s. d.
8228 tons coal carbonized at 24s. 5d.		10,045 0 0	
Less residual sales:			
Coke, 3702 tons	3,587 0 0		
Tar, 89,108 gallons	531 0 0		
Sulphate, 82 tons	856 0 0		
		4,974 0 0	
		£5,071 0 0	
Carbonizing wages, 8228 tons at 2s. 10d. (1914-15 rate)		1,166 0 0	
			6,237 0 0

Vertical Retorts.

7299 tons coal carbonized at 24s. 5d.		£8,908 0 0	
Less residual sales:			
Coke, 3769 tons	3,652 0 0		
Tar, 89,848 gallons	535 0 0		
Sulphate, 87 tons 8 cwt.	916 0 0		
		5,103 0 0	
		£3,805 0 0	
Carbonizing wages, 7293 tons at 1s. 10·5d.		687 0 0	
			4,492 0 0
Gross saving			£1,745 0 0
Interest and redemption on capital outlay			691 0 0
Net saving			£1,054 0 0

ECONOMY IN COAL CONSUMPTION.

The subjoined statement on the subject of economy in coal consumption has been issued by Mr. Arthur Wright, who intimates that the Coal Controller has authorized him to circulate it.

The Controller of Coal Mines has been advised that an economy in the use of coal can be effected, and much inconvenience avoided during the next and succeeding winter, by the giving effect as far as possible to the following suggestions:

(1) POWER USES.—That the various factory owners throughout the country who at present generate their own power by means of coal should make arrangements for taking their power requirements from an outside source, in districts where the power supplies have a margin available, and thereby reduce the total amount of coal used. The Coal Controller will assist as far as possible in obtaining priority for plant, machinery, and motors required, provided a substantial coal saving can be demonstrated.

(2) USE OF COKE.—The use of locally produced coke or coke breeze in place of coal as much as possible in domestic grates, factory furnaces (where such cannot take an outside supply), and public utility plants at light loads, also in baths and washhouses, provided coke is available in sufficient quantities.

(3) PUBLIC SERVICES.—The curtailment of those public services which entail coal consumption, such as early and late tramway running—after consultation with the Ministry of Munitions where munitions workers are likely to be affected—and the prevention of unnecessary use of water.

(4) STOCKS.—The accumulation of stocks in the summer months, as far as deliveries will permit, of the coal required during the winter months, the cost of such storage being considered as a form of insurance against the probable coal shortage.

(5) COOKING AND HEATING.—The installation of gas or electric cooking and heating appliances in public and private buildings, with a view of saving coal generally, and lessening the serious inconvenience to the public next winter should the local distribution of coal become irregular or insufficient.

(6) EMERGENCY DISCONNECTION.—The application to the Board of Trade by the electric supply authority for sanction under Regulation B1, to disconnect classes of non-essential consumers in cases of urgent necessity, in order to enable the supply to be continued to munition and other essential users. This power should be obtained, although it need not be put into execution until the necessity arises.

(7) INTERCONNECTION.—Making arrangements as suggested in the letter of the Board of Trade, dated May 25, 1916, with the neighbouring towns to interconnect electric distribution systems or generating plants by means of underground cables, or in suitable cases of temporary overhead wires over the intervening country, so as to enable one or two of the most economical power stations in each district to supply several towns at light loads, instead of each town having to run its own power station uneconomically at such times. This would also enable the various power plants to shut-down in turn during week-ends and holidays, to effect plant repairs, and would provide some amount of power at call as a stand-by in case of coal supplies giving-out locally.

In order to carry out the last suggestion, the Controller is advised that additional powers will have, in some cases, to be obtained, both as regards passing over private property, trading between public utility companies and local authorities, and possibly relief from some of the existing power supply regulations; and if cases are brought to his notice, they will receive his assistance where the saving in coal would warrant the provision of the necessary plant, mains, &c.

ADULTERATION OF COAL GAS.

Suggested Agreements with Manufacturers.

The subject of inert constituents in coal gas is one to which considerable attention has been directed editorially in the "JOURNAL" for some time past, with a knowledge of the subcurrent of events in this particular, and of the menace at the very doors of the industry. In the "Engineering Notes" of the "Daily Telegraph" on Wednesday last, reference was made to coal and town gas "adulteration." Regarding gas, the writer said:

As coal gas can be made, and is being supplied even at the present time by some companies, with not more than about 10 p.ct. of inert gases, it ought to be possible, making due allowance for the difficulties under which the gas companies are working, for these inert gases not to exceed about 15 p.ct. In many instances this figure is exceeded, and even 30 p.ct. and more waste products has been found to be present. To allow gas of such poor quality to be passed into the mains is neither fair to the consumer nor in the best interests of the gas undertakings themselves; and all users of coal gas for factory operations would find it to their advantage to make regular tests of the calorific value and analyses of the gas supplied to them. Large consumers, particularly before installing gas-melting plant, would be well advised to have an understanding with the gas company concerned as to the maximum percentage of inert gas permissible in the gas supplied, especially where high temperatures are required, as it is obvious that the highest temperatures cannot be obtained with gas containing an excessive percentage of incombustible constituents. It is obvious, too, that similar precautions are desirable in the case of power installations driven by gas-engines, the output of which must be affected if an undue quantity of inert gases—nitrogen and carbon dioxide—is fed into the engine as a substitute for the proper gaseous mixture.

GAS CONSUMPTION FOR VARIOUS PURPOSES.

In a recent number of "Het Gas," Heer Dr. Stavorinus, of the Amsterdam Gas-Works, had an article in which he discusses the dividing-up of the gas consumption in a house for various purposes. The subject arose out of the Government enforced economy; his object being to ascertain how this economy could best be secured without seriously affecting the domestic routine.

In the Technical Press, he says, there are but few communications to be found dealing with this matter. This is understandable, because the ascertaining of the exact amount of gas consumed for different purposes—such as cooking, heating, illuminating, and water heating—requires separate gas services, and as many meters. No private householder or tenant will go to the trouble or incur the expense of having his dwelling piped in a manifold manner. Only one case is to be found where the director of a German gas appliance manufacturing firm piped his house in this manner, so that he was able to gauge the consumption. On the other hand, there are available many results secured by the lady demonstrator of the Amsterdam Gas-Works, with meals prepared during cookery lectures; and from these it is possible to make some calculations concerning the gas consumption for a middle-class dinner in war time.

In these lectures, there have been cooked dinners for five or six persons in the same manner as may be done in any kitchen in ordinary practice. For a dinner consisting of soup, meat, vegetables, and sweets, the gas consumption ranges between 720 and 519 litres; the average being 652 litres (23 c.ft.). This makes in a year 8472 c. ft. of gas for the preparation of dinner, or 1694 c. ft. per head—not including, of course, the gas consumed for heating water or for the preparation of breakfast, luncheon, &c. Is it possible to secure some saving on these figures? The use of hay-boxes, and even newspapers, for packing

cooking vessels may, where necessary, considerably assist in restricting the use of gas.

The results of investigations show clearly that the heating of water for scullery purposes is the weak spot in the kitchen. Taking a boiling-ring of normal efficiency, and a copper of good construction, the gas consumed in the heating of water solely for kitchen and scullery purposes may amount to 58 p. ct. of the total consumed in the kitchen. The replacement of the ring and the boiler by a small water-heater or geyser effects a saving on this of 20 p. ct., owing to the higher efficiency of these appliances. It is therefore in the interest of gas suppliers and consumers to have water heating carried out exclusively by these geysers.

Now the question may be considered of how much gas is consumed for the lighting of a house. Taking an eight-roomed house, in which seven apartments are fitted with gas-lights—three sleeping rooms, each with one burner of normal capacity, and four living rooms, having together fourteen burners—the total consumption may be taken at 23,121 c. ft. a year, or 3318 c. ft. for each room. The point is as to whether these figures can be reduced to meet war conditions. It seems that seventeen burners for seven rooms are ten burners too many. Allowing for each room one burner in normal use, we arrive at an average of 10 burning hours daily, or a total of 3650 hours per annum. Assuming the burners are of normal efficiency, a total consumption may be reckoned of 12,884 c. ft. On the first figure mentioned, this means an economy of 10,237 c. ft., or 44 p. ct. on lighting only.

As to gas-fires, for the heating period there are taken 32 weeks, or 224 days. For a seven-roomed house, the gas consumption for heating has been found to amount to 41,548 c.ft. On the dimensions of the rooms, this comes to an annual gas consumption of 117 6 c.ft. for each cubic metre of air-space in the room. This figure is, however, naturally liable to many variations; so that one finds figures mentioned ranging between 3·27 and 3·95 c.ft. for consumers of normal constitution, and 5·92 c.ft. for those of more advanced age. All these figures represent consumption per annum per cubic foot of air-space. Other figures are 5·2 and 6·2 c.ft. for schools, and 5·2 c.ft. for factories. In dwelling-houses, the normal consumption may be regarded as being between 4 and 5 c.ft. per annum; but these figures are averages for the whole house. For sleeping rooms, one may accept 1·5 c.ft., and for living rooms 8 c.ft., as average figures. From these somewhat divergent figures, it may be concluded that there is ample room for war economy when the necessity exists.

To sum up, in an all-gas house the consumption may be taken as follows: Lighting, 22 p.ct. of the total consumption; room-heating, 43·4 p.ct; bath-heating, 5·5 p.ct.; cooking, 19·8 p.ct.; ironing, 1·3 p.ct.; water-heating, 8 p.ct. (with special water heater).

Price of Gas at South Shields.—The South Shields Corporation have received a letter from the Gas Company stating that the price of gas will be increased 6d. per 1000 c.ft., as from the June quarter.

CURRENT SALES OF GAS PRODUCTS.

Sulphate of Ammonia.

For the benefit of readers who may be wondering at the absence from the last two issues of the "JOURNAL" of the customary report on "Sulphate of Ammonia in the Provinces," it may be stated that the reason this is being omitted is because there is really nothing to comment upon in the abnormal situation that has been brought about in this trade. Prices for home agricultural purposes have been fixed by the Government for some considerable time past; and the export business has now to be done on lines laid down by the Food Production Department. Orders for shipment abroad can only be taken with the consent of the Distribution Committee, and all business has to be done through the Association; the profits being pooled between members of a group called the Sulphate of Ammonia Export Traders. In these circumstances, there are no fluctuations in values as in ordinary times; and consequently there is really no market to report upon.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 9.

The London tar products market is without alteration in prices. There are buyers of pitch inquiring for supplies for next season; and it is thought that about 40s. net per ton f.o.b. makers' works could be obtained.

Sulphate of ammonia is in demand for the home trade on the basis of the official figures; the manure mixers being anxious to secure supplies.

Tar Products in the Provinces.

July 9.

There is no alteration in the market for tar products. The prices quoted for pitch are quite nominal.

The average values for gas-works products during the week were: Gas-works coal tar, 20s. to 24s. 6d. Pitch, East Coast, 16s. 6d. to 17s. 6d. per ton; West Coast—Manchester 15s. 6d. to 16s. 6d., Liverpool 16s. 6d. to 17s. 6d., Clyde 17s. to 18s. nominal. Benzol, 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha, in bulk, North, 6½d. to 6¾d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, 3¾d. to 3¾d. Heavy oils, in bulk, North, 3¾d. to 4¼d. Carbolic acid, 60 p.ct., East and West Coasts, 3s. 4d. naked. Naphthalene salts, 80s., bags included. Anthracene, "A" quality, 3d. per unit; "B" quality, 1½d. to 2d.

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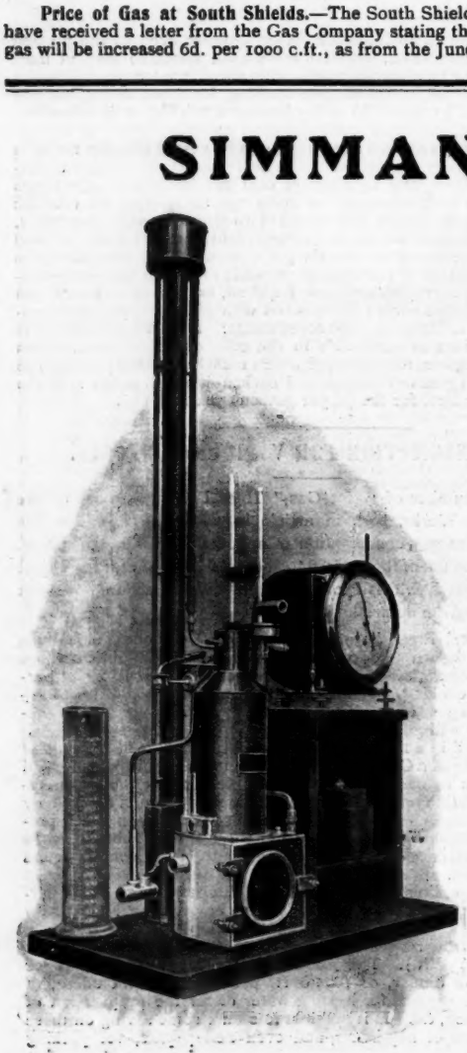

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COAL TRADE REPORT.

Northern Coal Trade.

The coal trade is active, and work at the collieries has been generally brisk; the demand for government needs and for the "controlled" factories being heavy. Best Northumbrian steam coals are steady at 30s. per ton f.o.b., second-class qualities are from 25s.; and steam smalls are steady at from 18s. 6d. to 19s. 6d. There is a fair inquiry for forward supply, and production is well taken up on the whole, though much of it is sold at old-contract prices. In the Durham coal trade there is a full inquiry, and the home consumption seems to be increasing. Gas coals are steady for best kinds; the quotations being: "Wear specials," from 29s. to 31s. per ton f.o.b.; best Durham gas, about 25s.; and second-class gas from about 23s. 6d. Freights are steady; the rate on gas coal being about 15s., Tyne to London. Contracts are believed to be closing more readily now; but the exact price does not publicly transpire, though the 4s. regulation makes changes from the last contracts very slight. There is now a very full demand for coking coal; and this has a steadying effect upon most kinds of Durham fuel. Good gas coke is selling freely generally; the price being from 31s. to 32s. 6d. per ton f.o.b., according to class. Tonnage is in need for coke; the rates to the northern ports of France being from 45s. to 46s.

Glasgow Coal and Gas Prices.—The Glasgow Corporation have purchased for the gas-works a total of 820,000 tons of coal for the requirements of the current year. The average price is about 18s. per ton delivered at the works, which is rather less than the price paid last year. Owing to increased wages and cost of materials, the price of gas to the ordinary consumers will be 2d. higher than last year, or 2s. 8d. per 1000 c.ft.

Coal Controller and Gas-Works' Requirements.—In the minutes of the Stockport Gas Committee, it was stated that the Gas Engineer (Mr. S. Meunier) recently had an interview at the office of the Controller of Coal Mines with reference to the delays on certain coal contracts, and the difficulty of renewing others. In consequence of the interview, he recommended the Gas Committee to advertise at once for the coal required. Mr. Meunier reported that the Controller's Department had promised to deal direct with the collieries in regard to the matters he had raised.

Death from Gas Poisoning.—Robert Quinlan, audit clerk in the War Office at York, was found dead in bed, with the room strongly smelling of gas, which was escaping from the burner of an incandescent light. His wife was away, but had been recalled owing to her husband having failed to attend at the office for a week past; and she came home to find him dead. Nothing was wrong in connection with deceased's work; but a neighbour said he had complained of being ill. The Coroner's Jury decided that there was not sufficient evidence to show how the gas had been left on.

Gas Profit Reduction at Loughborough.

In moving the adoption of the Gas Committee's minutes at the monthly meeting of the Loughborough Town Council, Mr. W. F. Charles, referring to the balance-sheet, said that there had been an increase in the capital account, mainly due to the extension of mains to manufacturing premises. Unfortunately, the balance-sheet was not a good one, or rather it was a good one in the circumstances; but the circumstances were bad. The cost of manufacturing showed an increase of £684, mainly due to extra cost of coal, cartage, fodder, and the purchase of two horses. The second item had decreased £317, or 53 p.ct., due to improvements in purifying, &c. Most of the other items showed slight increases, due chiefly to the extra cost of material and wages. On the general item of wages there was a slight decrease, due probably to the less quantity of gas made. On the other side, there had been a decrease in the quantity of gas sold of 7,853,000 c.ft. They were down in turnover in cash sales by £862 on gas alone; but they had a good increase in the sale of residuals of £961, mainly due to the increased price of coke. They were a little down on the sales of tar and ammonia. The slot meters, owing to the increase in the general price, were really losing for the Committee to the extent of 2d. per 1000 c.ft. The total profit for the year was £6509, against £6978, showing a shrinkage of £469. Interest and sinking fund came to £6483, against £6144—an increase of £329. The difference between the gross profits this year and the interest and sinking fund left a balance of only £25, as against £834 last year, excluding income-tax. The income-tax this year was £1753; and taking this from the £25 balance net profit, it left them with a balance in the profit and loss account of £1728, against £3544 last year. Another bad year such as they had had would wipe out their accumulated profit. They looked for an increased production of gas per ton of coal; but the main hope lay in a general increased consumption.

Worthing and the Calorific Power Order.—The Board of Trade have made the Order, under the Gas (Standard of Calorific Power) Act, asked for by the Worthing Gas Light and Coke Company. The Town Council have lodged a protest against the new standard remaining in operation for five years; and urge that, at the expiration of five years or such other shorter period as may be fixed by the Order, the question of increasing the standard calorific power or the pressure shall be automatically considered by the Board "whether application in that behalf be made to the Board or not."

Glasgow and the Calorific Standard.—The Town Clerk reported at a meeting of the Glasgow Corporation Gas Committee that the application which had been made to the Secretary for Scotland on behalf of the Corporation, for an Order under the Gas (Standard of Calorific Power) Act, 1916, to substitute for the standard of illuminating power of the gas supplied by the Corporation, a standard of calorific power of 500 B.Th.U., and for the testing of the gas, had been granted. The Committee, after hearing the General Manager (Mr. Alex. Wilson), instructed him to purchase the necessary testing apparatus.

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The Gas Engineership of Blackburn.

At Thursday's meeting of the Blackburn Town Council, Mr. Bates asked for information as to the standard of qualification on which the appointment of Mr. J. W. M'Lusky as Gas Engineer had been made [see p. 59]. The Mayor (Alderman Nuttall, who is also Chairman of the Gas Committee) said that the Special Sub-Committee, representing all sections of the Council, were appointed to find suitable men. They visited a good many places, and were unanimous in their recommendation; and this recommendation met with the unanimous approval of the Gas Committee. The question of his age was considered; but it was felt that they ought not to allow sentiment to stand in the way of their choice. Mr. M'Lusky's appointment would not affect his position in regard to the army. Mr. E. Porter, the Local Secretary of the National Union of Gas-Workers, moved to refer back the Committee's recommendation, as a protest against the method in which it had been brought about. He complained that the Gas Committee had not been taken into the confidence of the Sub-Committee as to the names and qualifications of the applicants, in order that they (the Committee) might come to an intelligent decision. The Labour party were as much entitled to know the names of applicants for this position as were other members; and to give effect to their protest, he moved to refer the report back: Mr. Bates, who seconded, said that Alderman Nuttall's reply was not an answer to his question. Mr. Gregson thought it unfortunate that the matter of this appointment had not been fully discussed in the General Purposes Committee, as much of what had been said that day might thus in this way have been avoided. Only three votes were recorded against the Gas Committee's recommendation.

Dundee Gas Accounts.—At the annual meeting of the Dundee Gas Commissioners, the Auditor pointed out that no depreciation was made on meters, stoves, or gas-fires, and no contributions had been made to contingent or reserve funds. The Convener pointed out they had written-off over £18,177 during the year, and were really in a healthy position. Nothing was added to capital; everything being paid out of revenue. Against temporary loans is a total of £72,000 of outstanding accounts and stocks on hand. The Auditor pointed out that the value of the Broughty Ferry station taken over by the Dundee Gas Commissioners should be written-down, as the plant was not now in use. The Lochee gasholder was dismantled and out of use, and the value should be written-off. The temporary loans aggregated £59,140. Mr. Crichton said the Broughty Ferry works stood in the books at £38,000; but he questioned if they were worth more than half this. Bailie Kinmond stated that the Engineer valued the materials at the Broughty Ferry works at £10,000; but prices had gone up, and he thought that the materials should be disposed of. The Treasurer said as regards capital debt, by the application of the sinking fund in 20 years there would be no capital debt on the gas-works.

Birkenhead's Claim to a Record Yield.

At the last meeting of the Birkenhead Town Council, the Chairman of the Gas Committee (Alderman M'Gaul) stated that, in spite of the high price of coal, oil, stores, and wages, the financial statement of the undertaking for the past year was very satisfactory. The profit was not quite so large as in pre-war years, but the gross amounted to £49,606, as compared with £46,216 last year. The interest and sinking fund was very heavy, amounting to £35,264. The Committee had spent £1000 out of revenue; and after deducting these charges they had taken £3384 from the fund termed the "reduction of price account." This gave the Committee an amount to be divided of £17,356, which had been allocated as follows; In aid of the rates, £5678; reduction of price account, £5678; renewals, £5000; special reserve, £1000. During the past year they had spent out of renewals and special fund £2234. The balance standing to the credit of the various reserves was £65,639. Last year there was made 1,011,000,000 c.ft. of gas, using 67,650 tons of coal. No water gas was manufactured for five months, and there was a conservation of oil and coke which stood the undertaking in good stead; there being a stock of something like 12,000 tons of coke in hand. In one respect a record was attained. They obtained from one ton of coal 12,466 c.ft. of gas. This was a record for any works of Birkenhead's description using the same type of coal. Thanks were due to the Engineer, to the staff, and to the whole of the employees for the excellent results obtained now that their new machinery was in proper working order. The undertaking now had 120 coal-wagons, which greatly assisted them in getting in stock for the winter. The show-room had done very well during the past year. There had been an output there of articles sold of 7288; being a considerable increase on the year before. The large number of cookers now in use had been the salvation of the concern so far as profits were concerned during the past year. The consumption in the day-time had been considerably more than it was at night, thanks to the fact that 24,655 cookers were in use.

Kirkcaldy Gas-Works Deficit.—The Kirkcaldy Burgh accounts show a deficit on the gas undertaking for the year of £489. The Town Council have increased the price of gas from 4s. 9d. to 4s. 11d. per 1000 c.ft.

Increase in Price at Ossett.—The Ossett Corporation have notified consumers that the price of gas will be advanced 3d. per 1000 c.ft. after the meters have been read at the end of the June quarter. The increased charge will be 3s. 3d.

Oldham Gas Department Salaries.—At the last meeting of the Oldham Town Council the following recommendations respecting salaries were approved: Mr. Tim. Duxbury (Gas Engineer), from £500 to £600 per annum; Mr. Isaac H. Massey (Distribution Superintendent), £312 per annum; Mr. Ernest Parry (Commercial Superintendent), from £250 to £312 (in twelve months).

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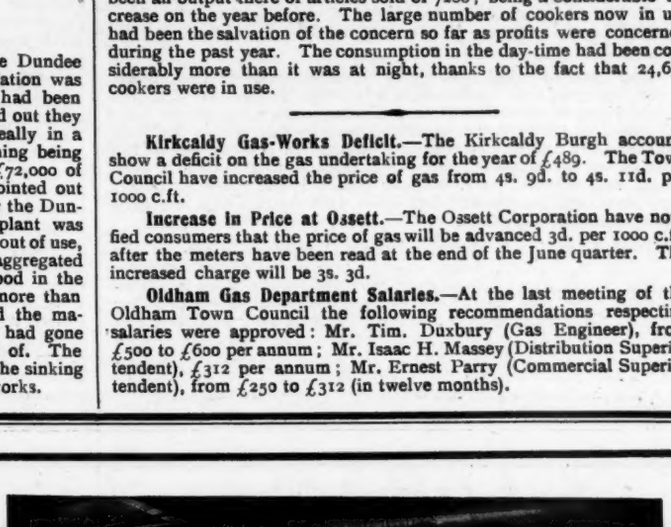

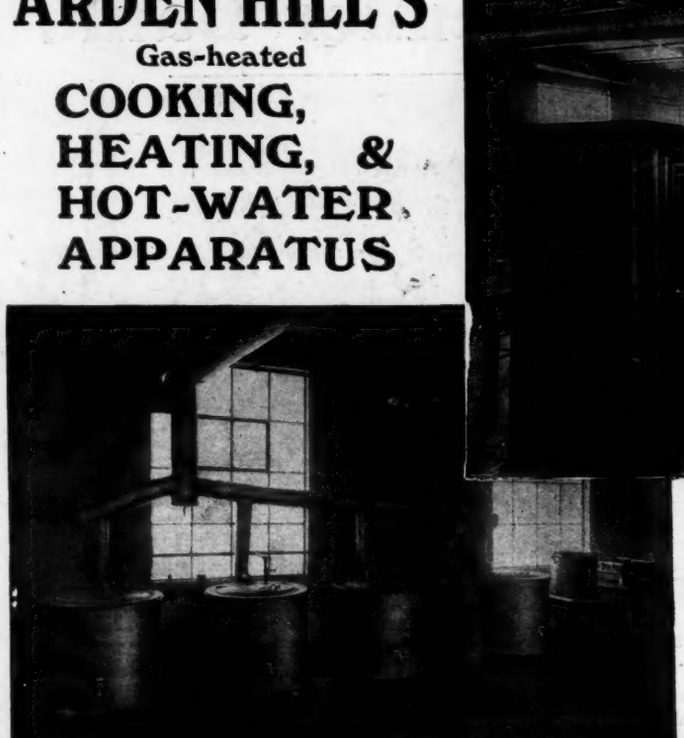

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Burton Gas Department and National Baby Week.

The Burton-upon-Trent Gas Department have, we learn from the Manager (Mr. R. S. Ramsden), been able to help the "Baby Week" movement by a general distribution of the British Commercial Gas Association pamphlet "Safeguarding the Babies," extracts from which were given in the news columns of both local papers. By arrangement with the Secretary of the B.C.G.A., two different "Baby Week" advertisements appeared in the local Press, each being repeated at a few days' interval. There was a recommendation as to every house having a gas-stove in a "Daily Telegraph" editorial on July 3; and this was quoted in the "Burton Gazette" the next evening. Advantage was taken of the suggestions in the B.C.G.A. leaflet to arrange three of the show-room windows as nurseries and bathroom, with a good display of suitable appliances; and attention was called to this at the foot of the local Committee's programme. The local Committee borrowed, and made use of, several domestic gas appliances for their Child Welfare Exhibition in one of the public halls; and altogether the uses of gas in connection with children's welfare have been brought very prominently before the public. The Gas Department are co-operating with the local Committee responsible, by letting them have the gas show-rooms for a demonstration on fruit bottling, by Mr. Stoney, Instructor in Horticulture to the Staffordshire County Council.

Oldbury Gas Manager's Salary Increased.

At a meeting of the Oldbury District Council on Friday, the Gas Committee recommended that the salary of the Gas Engineer and Manager (Mr. C. H. Carder) be increased by £100 per annum as from July 1. The Chairman of the Gas Committee (Councillor E. W. Jackson), in moving the adoption of the recommendation, pointed out that it was the salary which Mr. Carder's predecessor received; but at that time the quantity of gas made (140 million c.ft.) included 7½ millions supplied to Rowley and about 12 millions for public lighting. Last year the total make was 160 million c.ft., and included neither of these two items. Mr. Carder was appointed in Sept., 1914, when things had got behind badly, both in the state of the works and the finances, owing to the long and serious illness of the late Manager. There was then an overdraft of £10,800, whichi ncluded £6200 for the new gasholder. Mr. Carder re-organized the whole system of administration at the works, installed a water-gas plant, the cost of which (£3000) was paid out of revenue, and provided a new and larger exhauster. He had also put a roof over the purifier, and was now finishing a benzol plant. He had carried on very difficult negotiations with the Surveyor of Income-Tax, going back over a period of years, and settled the matter in a very satisfactory manner. The general overdraft of £4600 had been paid off, and £500 placed aside for the new holder; while the works had been put into a proper state of repair. Mr. Carder had turned out to be a thoroughly good man, and all the members of the Gas Committee were quite satisfied with what he had done. Some opposition was offered by one or two members; but they based it on the grounds of the high cost of gas, and because they considered £400 a year was too much to pay for the position. Mr. Jackson pointed out that the increased charges for gas, when set against the increased expenditure, had only brought them a net profit of £120. The recommendation of the Committee was adopted with four dissentients.

The Leslie Gas Light Company (Fife) have raised the price of gas from 5s. to 5s 7½d. per 1000 c.ft., owing to the large increase in expenditure. A dividend of 5 p.ct. is being paid for the past year.

The Bermondsey Borough Council have added a further increase of 20 p ct. to their pre-war charges for power and 10 p.ct. on electric lighting—making a total increase of 50 p.ct. on the former and 40 p.ct. on lighting.

The Heckmondwike District Council, having considered the Heckmondwike and Liversedge Gas Company's application to the Board of Trade for an Order to substitute a calorific for the illuminating power standard, resolved to offer no opposition.

It is stated that plant is about to be erected at Manchester for the manufacture of nitrogenous products by means of an electrical process of British origin, the rights for which are owned by the International Nitrogen and Power Company. The installation is expected to be at work within six months.

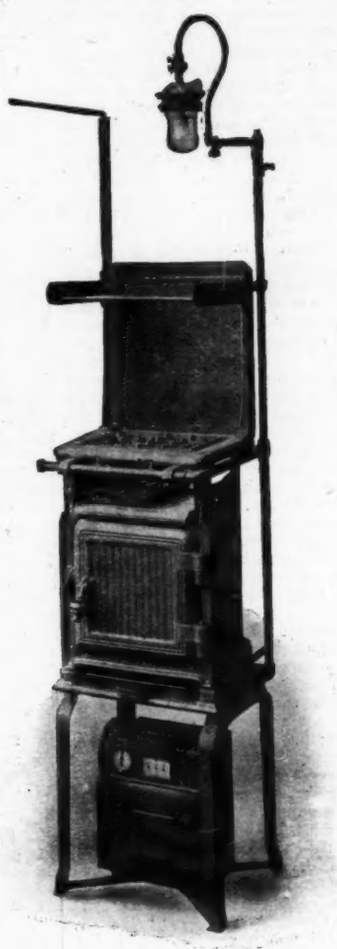
Messrs. Curtis's and Harvey, Ltd., have engaged the services of Mr. Robert W. Buckingham as a representative in connection with their incandescent gas-mantles. At the outbreak of the war, Mr. Buckingham was Sales Manager of the British Graetzin Company, which position he immediately resigned. Previous to that time he was the representative of the New Inverted Gas-Lamp Company.

Messrs. George Waller & Son, of Stroud, Glos., announce that (for family reasons) they, on the 2nd inst., registered the business as a Private Limited Company, and from the present time the style of the firm will be George Waller & Son, Ltd. The general management and conduct of the business will be the same as for many years past. For purposes of registration the capital of the concern has been fixed at £30,000 in £1 shares.

Mr. W. A. Schultz, of No. 50, Cannon Street, E.C., intimates that, feeling that all loyal subjects who, in common with himself, are British born and have devoted their lives to the service of the State, but who have hitherto borne names of German origin, have no other course open to them than to follow the example set by His Majesty, he has abandoned the name of Schultz, and adopted that of Scott. The style of his firm will therefore be "W. A. Scott and Co."

There is a remarkable popular impression in Shipley, according to local gossip, that there has been an increase of from 30 to 100 p.ct. in the gas the householders are supposed to have used during the past half year, according to the latest meter registrations, as compared with the corresponding period of the previous year; and yet everybody denies having used any more gas than usual for either lighting or cooking. A suggestion has been made in the town that a meeting of consumers should be held, with a view to appointing a deputation to seek an interview with the Gas Committee.

Slot Installations



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In the City Art Gallery, Leeds, an exhibition was opened yesterday, and will remain open until the 21st inst., of official photographs and samples of work upon which women are employed in engineering and other industries on munitions of war. It is organized by the Labour Supply Department of the Ministry of Munitions.

A Company has been registered, as "Successors to the Otto Coke-Oven Company, Ltd.," with a capital of £100,000 in £1 shares, to acquire part of the undertaking of the Otto Coke-Oven Company, Ltd., by licence of the Board of Trade, under the Trading with the Enemy Act.

STOCK MARKET REPORT.

THE Stock Exchange reopened on Tuesday in a cheerful mood and fully prepared to have a good time. It was the news from Russia that threw this bright ray upon the House. Perhaps the greater weight of public opinion had for some time past been optimistically tending and inclined to believe that the unrest wrought by extremists would gradually settle down. But probably no one was prepared for the kaleidoscopic change in the situation. That the Russian army should arise, take the field, and achieve a notable success, was almost beyond the bounds of possibility. The influence of this news was far-reaching, and markets in general took heart with increasing confidence day by day. The only "fly in the ointment" was the old complaint that business was still too quiet. This was to some extent a product of the favourable turn; for, in anticipation of a smart rise, sellers were not eager to accommodate would-be buyers.

The gilt-edged market was again conspicuously firm. Home Government issues were in the van, particularly Consols, which improved almost daily. Indian issues also showed advance. Home Rails had a marked recovery, enjoying a demand long estranged from them. Americans closed rather dull, and Argentines after a good start fell back towards the close.

In the Foreign Market, Russians were naturally in full favour, and French, Japanese, and Scandinavian were firm. Chinese internal affairs caused a set-back. Among the rest, South Africans were firm, Rubber was rather unsettled, and Oils, Breweries, and Textiles did well.

Business in the Gas Market showed a rather better tendency; the aggregate of transactions (after making allowance for a short week of only four days) being rather higher than has recently ruled as the average. Changes in quotation were not numerous, and were only slight in degree; but they moved both ways. Gas Light ordinary, Liverpool, British debenture, and River Plate advanced, while South Metropolitan, Imperial Continental, and European receded.

In the Money Market rates became firmer, and discount stiffened in view of Treasury Bill rates being raised from 4⅛ to 4⅜ p.ct.

Bargains done for cash during the week were as follows: On Tuesday, Brentford "B" 79, Cape Town 2¼, Commercial 4 p.ct. 72½, ditto 3½ p.ct. 66⅛, ditto debenture 51⅛, Gas Light ordinary 71¼, 71⅜, 72, 72½, Imperial Continental 80⅛, 81, 81⅛, San Paulo 8, South Metropolitan 74½, Southgate 10 p.ct. 142½, 143⅜, ditto 7 p.ct. 101¼, 101⅜, ditto preference 76⅛, 76⅝. On Wednesday, Bombay 4⅜⅛, Commercial debenture 52, Gas Light ordinary 71, 71⅛, 72, 72¼, ditto preference 73, 73⅛, ditto debenture 55⅜, 56⅛, Ilford debenture 66, 66½, Imperial Continental 80¼, Oriental 105, Primitiva 37s. 6d., ditto preference 55s., South Metropolitan 74, Tottenham "B" 69½, 70. On Thursday, Commercial 3½ p.ct. 66½, Gas Light ordinary 71½, 71⅝, 71¾, 72¼, ditto preference 73¼, 73½, Imperial Continental 80, 80⅛, Newcastle 70⅜, Oriental 105½, South Metropolitan 74½, 74⅝. On Friday, Alliance and Dublin debenture 62, Bournemouth "B" 10³⁄₃₂, 11³⁄₃₂, Gas Light ordinary 71¾, 72, 72¼, ditto debenture 56¾, Imperial Continental 80½, Primitiva preference 60s., ditto debenture 78½, South Metropolitan 74, 74½, Barnet "C" 135, ditto "D" 100.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Previous Div. or Dividend and Bonus.	Last Dividend.	NAME.	Closing Prices, July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
£			p.c.					
175,472	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	58—63	..
1,551,868	,,	April 8	2½	5⅛%	Alliance & Dublin Ord.	59—64	56—55	..
374,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76—79	58—63	62
280,000	5	April 29	7½	4/6	Bombay, Ltd.	5⅞—6⅛	4⅞—5⅛	4⅞⅛
50,000	10	Feb. 26	16	15/-	Bourne- { 10 p.c.	29—30	24—26	..
388,110	10		7	7/-	mouth Gas { B 7 p.c.	15—15½	10⅞—11⅛	10³³⁄₃₂—11³⁄₃₂
115,000	10	,,	6	6/-	and Water { Pref. 6 p.c.	13¼—14	9⅛—9⅜	
159,740	—	—	—	4%	{ 4 p.c. Deb.	..	69—71*	..
992,045	Stk.	Feb. 26	14	55/-	Brentford A Consolid.	261—266	81—84	..
734,920	,,	,,	11	53/9	Do. B New	204—209	79—83	79
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	83—88	..
221,400	,,	June 11	4	4%	Do. 4 p.c. Deb.	91—93	65—67	..
217,380	,,	Feb. 26	11	10%	Brighton & Hove Orig.	208—213	150—155	..
244,200	,,	,,	8	7%	Do. A Ord. Stk.	154—159	102—107	..
530,000	20	Mar. 26	12½	22/6	British	44—45	33—34	..
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	66—68*	..
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	54—56*	..
100,000	10	—	—	—	Cape Town & Dis., Ltd.	1½—2½	2½—2¾	2½
100,000	10	—	—	4½%	Do. 4½ p.c. Pref.	4—6	6—7	..
100,000	Stk.	June 26	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	60—65*	..
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	79½—80½	..
1,513,280	,,	Feb. 12	5/9/4	49/4	Commercial 4 p.c. Stk.	106—108	73—74	..
560 000	,,	,,	5½	46/8	Do. 3½ p.c. do.	103—105	66—68	72½
475,000	,,	June 11	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	51—53	66½
800,000	,,	,,	4	—	Continental Union Ltd.	76—79	39—41	51 —52
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	60—62	..
278,400	—	—	—	11⅛%	Croydon B and C 7 p.c..	..	170—180	..
—	—	—	—	10%	Do. E	..	..	..
492,270	Stk.	—	6	5⅛%	Derby Con. Stk.	123—125	95—100	..
55,000	,,	—	4	4%	Do. Deb. Stk.	102—104	80—83	..
1,002,180	10	July 29	10	7/6	European, Ltd.	17½—18	11—12	..
16,313 480	Stk.	Feb. 10	4/17/4	42/-	Gas { 4 p.c. Ord.	98—102	71—73	71—73½
2,600,000	,,	,,	3½	3½%	Light { 3½ p.c. max.	76—79	56—58	..
4,062,235	,,	,,	4	4%	and { 4 p.c. Con. Pref.	96—99	72—74	73—73½
4,674.850	,,	June 11	3	3%	Coke { 3 p.c. Con. Deb.	72½—74½	55—57	55⅛—56½
130,000	,,	,,	10	10%	{ 10 p.c. Bonds	..	..	..
258,740	,,	Mar. 12	5	4½%	Hastings & St. L. 3½ p.c.	87—89	50—53	..
70,000	10	April 29	11	6%	Hongkong & China, Ltd.	16½—16¾	7½—8⅛	..
86,600	—	—	—	9½%	Hornsey 7 p.c..	..	120—130	..
121,000	Stk.	Mar. 12	7½	7⅛%	Ilford A and C.	151—154	102—107	..
65,780	,,	,,	6¾	5⅞%	Do. B	115—118	80—85	..
65,500	,,	June 26	4	4%	Do. 4 p.c. Deb	92—94	66—69*	66—66½
4,940,000	,,	May 14	9	4½%	Imperial Continental	150—160	79—84	80—81½
1,235,000	,,	Feb. 12	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	62—65	..
235,242	,,	Mar. 12	6½	6½%	Lea Bridge Ord. 5 p.c.	119—121	85—90	..
2,498,905	,,	Feb. 26	10	5%	Liverpool 5 p.c. Ord. { A	211—213	83—83	..
					{ B	146—148		
306,088	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	72—74	..
75,000	5	June 11	6	2/-	Malta & Mediterranean	4½—4⅝	3⅞—4⅛	..
250,000	100	April 1	4½	4½%	Met. of { 4½ p.c. Deb.	99—101	88—98	..
541,920	20	May 28	4	6/-	Melbourne {			
1,875,892	Stk.	July 29	4½	4½%	Monte Video, Ltd.	11½—12	8—8½	..
529,705	,,	June 26	3½	3½%	Newcastle&Gatsh'dCon.	99½—99½	70½—71	70⅜
55,940	10	Feb. 26	7/14/0	7%	Do. 3½ p.c. Deb.	82—83	71—73*	..
300,000	Stk.	May 14	8	8%	North Middlesex 7 p.c..	14—15	10—11	..
60,000	5	Mar. 26	10	1/-	Oriental, Ltd.	117—122	104—106	105—105½
60,000	50	Feb. 26	13	12½%	Ottoman, Ltd.	7¼—73	2—3	..
100,000	50	,,	12	11%	Portsea, Island B	128—131	92—97	..
52,000	50	,,	10	9%	Do. C	118—121	85—90	..
249,980	5	April 29	8	—	Do. D	..	..	..
499,960	5	June 26	5	2/6	Primitiva Ord.	5½—6	1⅞—2½	37/6
521,600	100	June 2	4	4%	Do. 5 p.c. Pref.	4⅝—5	2⅜—3½	55.—6⅓
—	—	—	—	4%	Do. 4 p.c. Deb.	91—93	76—80	78½
346,198	Stk.	June 26	4	4%	Do. ,, ,, 1911	..	..	..
150,000	10	May 14	6	6/-	River Plate 4 p.c. Deb.	85—87	59—61*	..
125,000	50	July 1	5	5%	San Paulo { 6 p.c. Pref.	10½—11	7⅜—8½	8
135,000	Stk.	Mar. 12	10	10%	{ 5 p.c. Deb.	47—49	40—42*	..
209,984	,,	,,	10	10%	Sheffield A	223—224		
523 500	,,	,,	10	10%	Do. B	223—224	178—182	..
90,000	10	May 28	9	6/-	Do. C	220—222		
6,609,895	Stk.	Feb. 10	5/4/0	46/8	South African.	10½—11¼	8¾—9¼	..
1,895,445	,,	July 10	3	3%	South Met. 4 p.c. Ord.	111—113	73—75	74—74½
224,820	,,	Feb. 26	8½	8%	Do. 3 p.c. Deb.	72½—74½	56—59	..
952,795	,,	,,	6	48/4	South Shields Con. Stk.	157—159	140—142	..
60,000	,,	,,	5	5%	S'th Suburb'n Ord. 5 p.c.	114—116	76—78	..
135,000	—	—	—	48/4	Do. 5 p.c. Pref.	110—112	77—79	..
187,558	Stk.	June 26	5	5%	Do. West Kent	..	..	..
647,740	,,	May 14	5	5%	Do. 5 p.c. Deb. Stk.	116—118	86—88*	..
120,000	,,	Feb. 12	7½	5%	Southampton Ord.	99—102	96—78	..
782,275	,,	,,	6	3⅛%	Tottenham { A 5 p.c.	135—138	93—100	..
181,255	,,	June 26	4	4%	District { B 3½ p.c.	115—117	68—73	69½—70
182,380	10	Dec. 30	5	—	{ 4 p.c. D.b.	87—89	63—65	..
149,900	10	July 1	5	5%	Tuscan, Ltd.	5—6	1—2	..
236,476	Stk.	Mar. 12	5	5%	Do. 5 p.c. Deb. Red.	93—95	60—65	..
					Tynemouth 5 p.c. max..	108½—109½	89—91	..
80,000	,,	Feb. 26	8⅜	80/-	Wandsworth, Wimbledon, and Epsom—			
255,636	,,	,,	6½	65/-	Wandsworth A 5 p.c..	151—156	114—119	..
108,075	,,	,,	5/17/3	56/-	Do. B 3½ p.c.	129—134	99—101	..
352,000	,,	,,	6½	58/9	Do. C 3½ p.c.	110—115	86—91	..
98,000	,,	,,	6⅜	65/-	Wimbledon 5 p.c..	117—122	88—96	..
88,416	,,	June 26	3	3%	Epsom 5 p.c.	121—126	96—101	..
					3 p.c. Deb. Stk.	66—69	50—53*	..

* Ex. Div.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

ENGINEER AND MANAGER. Airdrie Gas Department. Applications by July 19.

CHIEF CLERK AND ACCOUNTANT. No. 6324.

REPRESENTATIVES. No. 6316.

SULPHATE MAKER AND YARDMAN. Tiverton Gas-Works.

STOKER. Tiverton Gas-Works.

Plant, &c. (Second Hand), Wanted.

PURIFIERS. Halesworth Gas-Works.

Plant (Second Hand) for Sale.

REVERSING, BYE-PASSING, AND MAIN STOP VALVE. Redman, Arnside.

STATION GOVERNORS. Tipton Gas Department.

Meeting.

COMMERCIAL GAS COMPANY. Cannon Street Hotel, Aug. 16, Twelve o'clock.

TENDERS FOR

Brass and Gun Metal Goods.

SALFORD GAS DEPARTMENT.

Coal.

MACCLESFIELD GAS DEPARTMENT. Tenders by July 23.

WIGAN GAS DEPARTMENT. Tenders by July 13.

General Stores (Castings, Tubing, Iron and Steel, Lead Pipes, Oils, Paints, &c.

SALFORD GAS DEPARTMENT.

Meters.

SALFORD GAS DEPARTMENT.

Retort Setting, &c.

CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by July 20.

Tar and Liquor.

HORSHAM GAS COMPANY.

MALVERN GAS DEPARTMENT. Tenders by July 23.

R. & J. DEMPSTER, LTD., ENGINEERS, 64 & 2300 MANCHESTER. PAN ASH, DUKE, SHEEZE & COAL WASHER. SOLE MAKERS OF THE "K" PATENT